LILIN®

H.264 FULL HD VIDEO RECORDER 4CH/9CH/16CH

NVR104/109/116

INSTRUCTION MANUAL

Introduction

The NVR series:

- NVR116 – 16-channel standalone Network Video Recorder
- NVR109 – 9-channel standalone Network Video Recorder (not front panel supported)
- NVR104 – 4-channel standalone Network Video Recorder (not front panel supported)

The NVR series offers a standalone solution for managing IP cameras and systems. It uses high quality H.264 decoders to deliver 1080P/720P/D1/VGA IP camera streams. Each channel can be individually configured to SD and/or HD resolution to optimize storage space.

Embedded HDMI and VGA engines offer 3D intellectual motion adoptive refinement, providing a maximum resolution of 1080P. The TV wall design allows the NVR to be cascaded via TCP/IP network for easy cabling. The NVR series has an IP scan facility, (WS Discovery) which locates all the cameras on the network and imports a preview thumbnail of each channel. This is an automated installation wizard that speeds up commissioning. The self-diagnostic feature monitors the internal temperature, cooling fan, HDD I/O speed, network status and information can be accessed via the health check report.

The NVR can be controlled via multiple input methods; front panel keypad with jog/shuttle control, LILIN remote control, LILIN keyboard with PTZ joystick, touch screen monitor, or USB mouse. When connected to a touch screen monitor, Smartphone style features like 'pinch and zoom' can be used to navigate the system.

The NVR series provides various export methods including DVD/RW, USB DVD/RW, USB flash disk, and HTTP download playable via Backup Manager. Extensive support for iPhone, iPad, BlackBerry and Android allows for remote viewing of the connected cameras at high frame rates. Browser based remote live monitoring and video playback features are also supported.

Features

- Standalone NVR
- Touch screen interface
- 1080P 16-channel/9-channel/4-channel at 25FPS with up to 48MBPS network throughput.
- Full HD 1920*1080P HDMI output
- VGA output up to 1920*1080P, built-in 3D intellectual motion adoptive refinement and vivid image enhancement engines
- Can support up to 8 SATA HDDs for 16-channel, 4 SATA HDDs for 9-channel, and 2 SATA HDDs for 4-channel
- Easy-to-use jog/shuttle front panel control
- HTTP browser based viewing including NVR configuration, PTZ control, playback, and live monitoring
- IP scan utility
- Extensive support for iPhone, iPad, BlackBerry and Android devices
- Slim DVD R/W supported (optional)
- CMX 3.6 software supported

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Caution

- Do not drop or strike the equipment
- Do not install the equipment near naked flames or heat sources
- Do not expose this unit to rain, moisture, smoke or dusty environments
- Do not cover the opening of the cabinet with cloth or plastic or install this unit in a ventilated place. Allow 10cm between this unit and its surroundings
- Do not continue to operate the unit under abnormal conditions such as detection of smoke, strange smell or no display on screen whilst power is turned on
- Do not touch the power connection with wet hands
- Do not damage the power cord or leave it under pressure
- To avoid unnecessary magnetic interference, do not operate this unit near magnets, speaker system, etc.
- All connection cables must be grounded properly

CAUTION

RISK OF EXPLOSION IF BATTERY IS REPLACED
BY AN INCORRECT TYPE.
DISPOSE OF USED BATTERIES ACCORDING
TO THE INSTRUCTIONS

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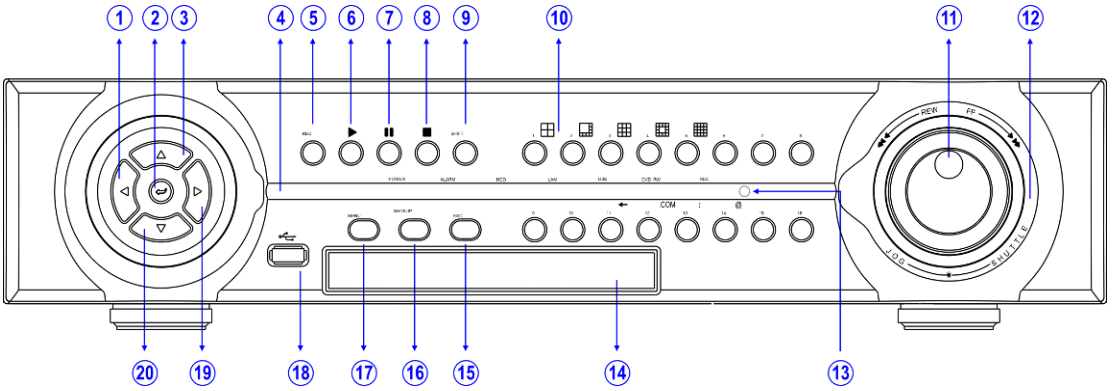
User Guide

Chapter 1: Basic Operation

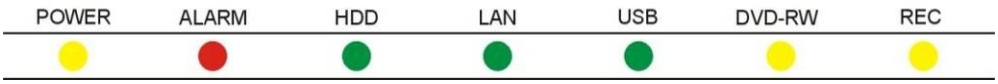
1.1 NVR116 Front Panel



1. **Left**
   Move cursor left
   Pan left
   Decrease value
2. **Enter**
   Enter operation in menu setup
   Instant PTZ camera selection at live mode
   Camera active
3. **Up**
   Move cursor up
   Tilt up
4. **LED status panel**
5. **REC button**
   Start or stop recording
6. **Play button**
   Use this button to start playback
7. **Pause button**
8. **Stop button**
9. **Shift**
   Mode switch for split-display or camera selection
10. **Split-display/camera buttons**
    4, 8, 9, 13, 16 split-display
    Camera selection mode
11. **Jog dial**
    Play recorded image frame by frame in playback
    Perform zoom in and out
12. **Shuttle ring**
    Fast forward video in playback mode.
13. **IR receiver**
14. **Built-in Slim DVD/RW drive**
    (DVD model only)
15. **ESC button**
16. **Backup button**
17. **Menu button**
18. **USB 2.0 connector**
    USB flash disk
    USB DVD/RW
19. **Right button**
    Move cursor right
    Pan right
    Increase value
20. **Down button**
    Move cursor down
    Tilt down

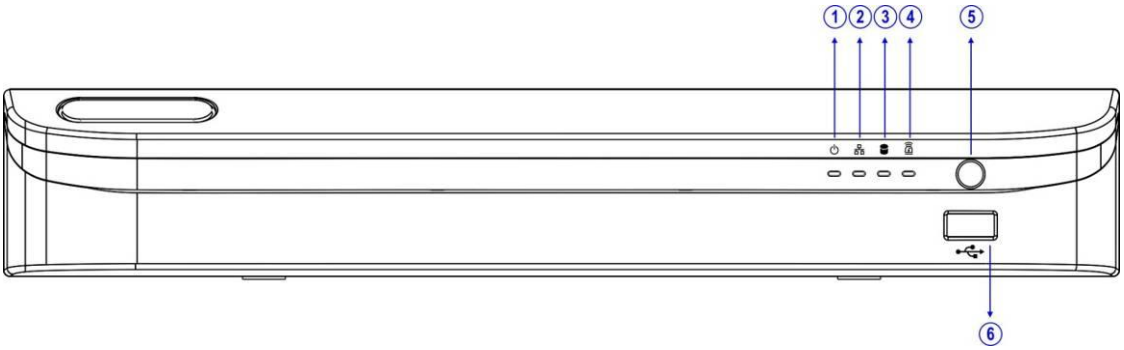
NVR116 LED Panel

The status of each LED is described in the following table:



LED	Description	Colour
POWER	NVR power on/off indicator	Yellow
ALARM	External alarm switches indicate motion or alarm triggers	Red (flashing)
HDD	HDD recording indicator	Green (flashing)
LAN	LAN access light	Green
USB	USB device access light	Green
DVD-RW	Backup LED indicator	Yellow (flashing)
REC	Recording indicator	Yellow

1.2 NVR109/NVR104 Front Panel



1. **POWER LED (Yellow)**
   NVR power on/off indicator
2. **LAN LED (Green)**
   LAN access light
3. **HDD LED (Green blinking)**
   HDD recording indicator
4. **Alarm LED (Red blinking)**
   Indicates motion or alarm triggers
5. **IR receiver**
6. **USB 2.0 connector**
   USB flash disk / USB DVD/RW

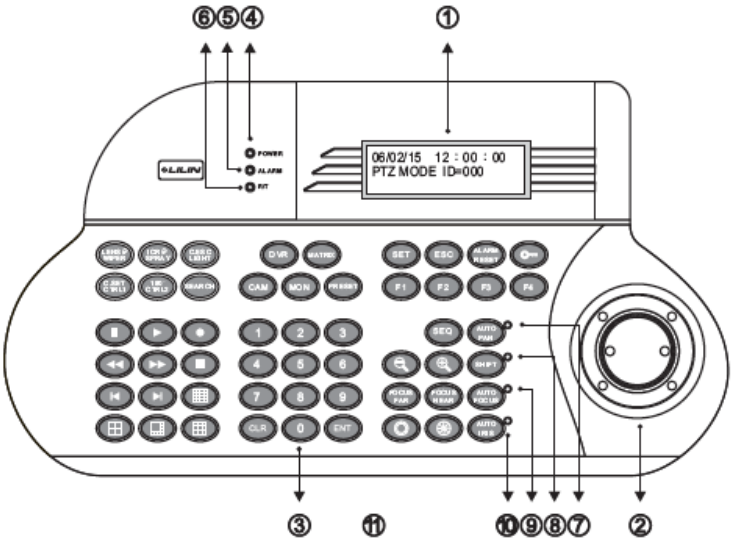
1.3 Remote control

The LILIN remote control is a small wireless handheld device with an array of buttons for adjusting settings. The buttons are separated in regions based on their features including NVR operational keys, Pan, Tilt, and Zoom (PTZ) and numerical keys.

NVR remote control operational keys	
MENU	Setup menu
ESC	Escape/exit/stop
SHIFT	Split and full screen switch
ZOOM	Digital video zooming
REC	Record/stop recording
FREEZE	Live video freeze
	Pause
	Playback
	Stop
	Fast forward
	Fast rewind
	Next single channel
	Previous single channel
	4 split display
	8 split display
	9 split display
	13 split display
	16 split display
AUDIO	Audio/mute
BACKUP	Video backup
DVR/NVR	Addressable NVR control
LANGUAGE	Language selection
BACKSPACE	Delete character

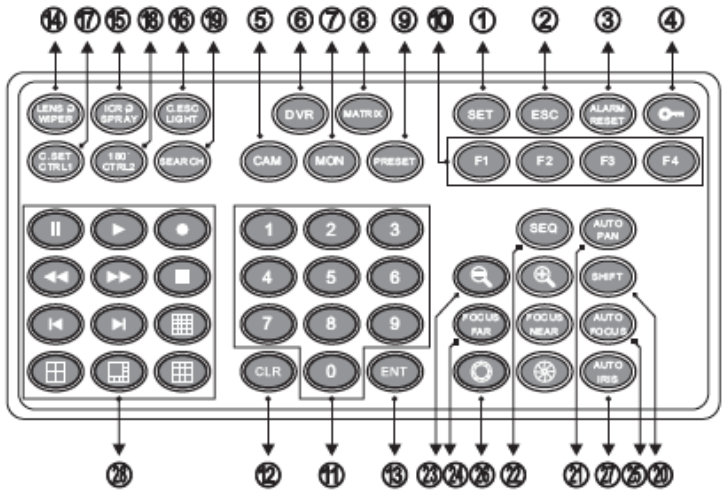
Auto Pan	Perform auto pan feature		Move up/tilt up
Zoom in	Zoom in		Move down/tilt down
Zoom out	Zoom out		Move left/pan left
Preset	Call preset		Move right/pan right
0 to 9	Numerical keys	ENTER	Enter/set

1.4 Keyboard



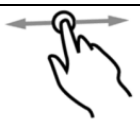
Keyboard controls

1. **LCD display** – display the keyboard system setup menu and operation information
2. **Joystick** – 3 axis (Pan/Tilt/Zoom) / 2 axis (Pan/Tilt)
3. **Keypad panel** – there are 54 keys which can control PTZ, matrix, DVR and telemetry receivers
4. **Power indicator**
5. **Alarm indicator**
6. **R/T indicator** – data communication indication
7. **Auto pan indicator**
8. **Shift indicator** – shift key status indication
9. **Auto focus indicator**
10. **Auto iris indicator**
11. **RJ-45 connector**



1. **Set** – enter setup menu mode
2. **ESC** – exit
3. **Alarm reset** – reset alarms and video loss alarms
4. **Keyboard lock** – press for 2 seconds to enter locking mode, press again to unlock the keyboard
5. **Cam** – select a particular camera
6. **DVR** – select a DVR
7. **Mon** – select a monitor
8. **Matrix** – press shift + matrix to switch to matrix control mode
9. **Present** – recall and store preset options
10. **Function keys**
11. **Numerical keys** – 0-9 for entering monitor, DVR, camera number
12. **CLR** – clear to setting data
13. **ENT** – enter or confirm data programming
14. **Wiper/lens**
15. **Spray**
16. **Light/C.ESC**
17. **CTRL 1 / C.SET**
18. **CTRL 2 / 180**
19. **Search**
20. **Shift**
21. **Auto pan**
22. **SEQ**
23. **Zoom in / zoom out**
24. **Focus far / focus near**
25. **Auto focus**
26. **Iris open / iris close**
27. **Auto iris**
28. **DVR control keys**

1.5 Touch screen

Pinch Zoom Out	Swipe
	

Pinch and zoom:
Pinch the area on the touch screen where you want to zoom. To zoom in move your fingers outwards, and to zoom out move your fingers inwards

Scroll screen: Swipe the screen left and right to navigate through the menus

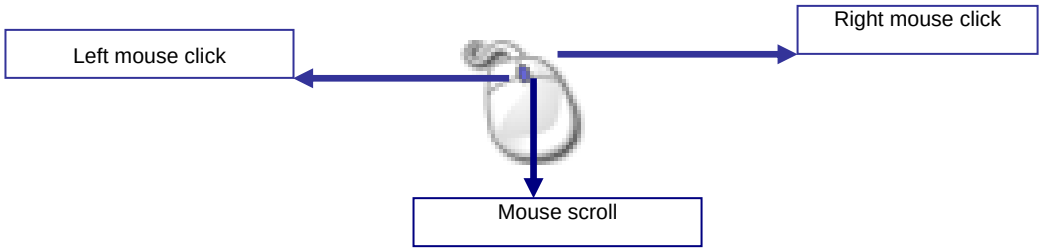
Single tap: Tap icons to select

Double tap: Double tap in camera view to return to previous menu

1.6 Mouse operations

The NVR has a USB mouse interface

General mouse operations can be used to navigate the device



Note: The NVR Touch can be controlled via multiple methods; a) front panel (NVR116 only), b) LILIN keyboard, c) LILIN IR remote control, d) touch screen monitor or e) USB mouse. For the purpose of this manual, USB mouse and touch screen will be referred to as one operation where applicable, "Touch screen monitor/mouse" hereinafter. For specific operations, "Touch screen" or "Mouse" will be referred to separately.

1.7 Menu symbols

Home short cut keys:

 Menu

 Pause

 Alarm

 Backup

Main menu keys:

 PTZ

 Export / backup

 Screen view

 Shut down

 Alarm manager

 Live display

 Configuration menu

 Playback

 Event

Additional menu keys:

 – Return to previous screen

 – Return to live mode

Chapter 2: Camera selection

a. Via front panel

To select multiple screen views, press  depending on required view.

To select a single full screen view, press shift and your required number

Press shift again to revert back to multi screen view.

b. Via remote control

To select multiple screen views press 

To select a single full screen view, enter the numerical value of the camera, e.g. for camera 3, press '03'.

c. Via keyboard

To select multiple screen views, press 

To select a single full screen view, enter the numerical value followed by the cam button, e.g.  + 

d. Via touch screen monitor / mouse

To select multiple screen views, press 

Chose your required view by selecting  or  or  or  or  or 

Select 

To revert back to multi screen view, click anywhere on the image screen

Note: When the camera title is yellow, you have control over that camera.

Chapter 3: Digital zoom

The NVR provides 64x digital zoom capability for live monitoring and video playback modes. To digitally zoom, follow the steps below:

a. Via front panel

Select desired channel

To zoom in and out, use inner control on jog shuttle

To move around the screen use direction (left, right, up, down) keys

To return to live view press 'shift'

Press desired camera channel (numerical value, e.g. 1) to move to a different camera view

b. Via remote control

Select desired channel

To zoom in and out, press 'zoom' button to activate

Use directional keys to move around the screen

To return to live view, press  depending on required view

c. Via keyboard

Use alternative method

d. Via touch screen monitor

Select desired channel

To zoom in and out, use pinch and zoom technique

Swipe touch screen monitor to move around the screen

To return to live view, tap once anywhere on the image

e. Via mouse

Select desired channel

To zoom in and out use mouse wheel

To move around the screen press right or left mouse button, drag and release

To return to live view click once anywhere on the image

Chapter 4: Freeze

The NVR can freeze screen images in live and playback modes. Whilst frozen the NVR is still recording.

a. Via front panel

Press 'pause' on the front panel

Once paused, the pause icon at the top left hand side of the screen will be highlighted in blue

To return to live mode press 'pause' again

b. Via remote control

Press 'pause' on the remote control

Once paused, the pause icon at the top left hand side of the screen will be highlighted in blue

To return to live mode press 'pause' again

c. Via keyboard

Press the pause button on the keyboard

Once paused, the pause icon at the top left hand side of the screen will be highlighted in blue

To return to live mode press pause again

d. Via touch screen monitor / mouse

Press the pause icon at the top left hand side of the screen

Once paused, the pause icon will be highlighted in blue

To return to live mode, press pause icon again

Chapter 5: PTZ

If the camera is a Pan, Tilt and Zoom (PTZ) camera, you can control it via the following methods:

a. Via front panel

Select required channel

Use direction arrows to pan and tilt around the image

To zoom, use alternative method

b. Via remote control

Select required channel

Use direction arrows  to pan and tilt around the image

Use 

and 

keys to zoom around the image

To send a dome to a preset position, press 'preset', followed by the number required. For example, for preset 3, press 'preset' followed by '003'.

Press auto button to start auto pan tour

To deactivate the tour, press 'auto' again

c. Via keyboard

Select required channel

Use joystick (left, right, up and down) to pan and tilt around the image

Twist the joystick to zoom around the image

To send dome to a preset position, press numerical key followed by 'preset' For example, 5 followed by 'preset'.

Press 'auto pan' to start auto pan tour

To deactivate the tour, press 'auto pan' again

d. Via touch screen monitor/ mouse

Select required channel

Select menu button, press PTZ icon 

Use the below controls to navigate the PTZ. The red joystick can be dragged to navigate the image

Press 'ESC' to return to menu

Chapter 6: Audio

a. Via remote control

To enable audio, select the required channel

Press 'audio' on the remote control to enable live audio

Press 'audio' on remote control again to disable live audio

For all other methods, mute volume to disable audio

Chapter 7: Playback

7.1 Accessing playback

a. Via front panel

To access playback press the play button

b. Via remote control

To access playback press the play button

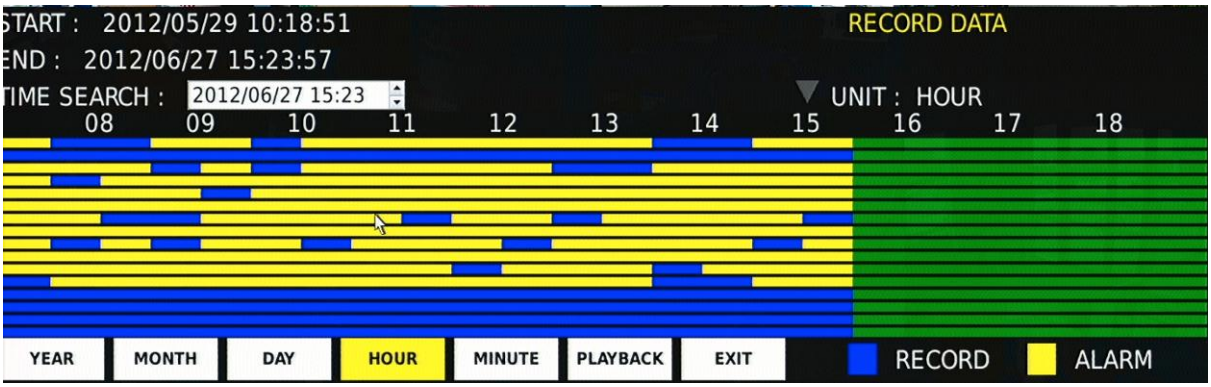
c. Via keyboard

To access playback press the play button

d. Via touch screen monitor / mouse

To access playback press  then 

7.2 Select time and date for playback



a. Via front panel

Use up and down keys to navigate time frame (minute, hour, month, year)
Use left and right keys to position unit selector

To start playback press 'enter'

or

Press 'shift' to move between recorded data and time search.

Use  to select time and date press 'enter'

b. Via remote control

Use  to navigate time frame (minute, hour, month, year)

Use  to position unit selector

To start playback, press 'enter'

or

Press 'shift' to move between recorded data and time search.

Use  to select time and date, press 'enter'

c. Via keyboard

Use joystick directions up and down to navigate time frame (minute, hour, month, year)

Use joystick left and right to position unit selector

To start playback twist zoom the joystick

d. Via touch screen monitor

Navigate time frame via pressing desired period, select time by dragging unit selector

or

Use pinch zoom technique to change time frame

Select time by dragging unit selector

or

To start playback touch desired time within camera bar

e. Via mouse

Navigate time frame via pressing desired period

Select time by dragging unit selector

or

Use mouse to enter time and date in time search bar using the scroll wheel or up and down arrows on screen

To start playback, hit the playback icon

7.3 Playback controls

 Step rewind

 Rewind

 Play

 Fast forward

 Step fast forward

 Pause

 Stop

 USB

 Audio

 Full screen view

 Quad view

 8-screen view

 9-screen view

 13-screen view

 16-screen view

a. Via front panel

Use front keys to play, stop or pause

For fast-forward or rewind use jog shuttle control 

Increase twist to speed up direction

For step rewind/forward use inner circle on jog shuttle

To select individual cameras or change screen view, follow camera selection process

To turn audio on or off press 'menu'

To activate WYSIWYG (what you see is what you get) backup, insert USB and press 'backup'

The USB icon will light to show backup has commenced

To stop recording press 'backup' again

To exit playback press stop or escape

b. Via remote control

Use remote keypad to play, stop or pause

Use button  to rewind

Use  to fast forward. Press once for 2x and subsequent press to increase speed

For step rewind/ forward, press pause then use your controller keys  to move frames

To select individual cameras use 

For grid screen view, follow camera selection process.

To turn audio on or off, press the audio key

To activate WYSIWYG backup, press 'backup'

The USB icon will light to show backup has commenced

To stop recording, press 'backup' again

To exit playback, press stop or escape

c. Via keyboard

Use keyboard keys to play, stop, or pause

Use button  to rewind. Use  to fast forward

Press once for 2x and subsequent press to increase speed

For step rewind/ step fast-forward press pause then use your controller keys  to move frames

d. Via touch screen monitor / mouse

Use on screen keys to play, stop or pause

Use button  to rewind. Use  to fast forward

Press once for 2x and subsequent press to increase speed

For step rewind/step fast-forward, use keys  to move frames

To exit playback press stop or escape

To activate WYSIWYG backup, insert USB and press 'backup'. The USB icon will light to show backup has commenced. To stop recording, press 'backup' again.

Note: For all methods, with WYSIWYG backup, all channels will be exported regardless of on screen camera selection. Once backup has been activated, playback will slow down. If fast-forward is selected, when playing back the file, the speed will be normal however the frame rate will be reduced.

Chapter 8: Alarm Management

Alarm events:

- Motion – created by movement
- Sensor – created by hardwired normally open / normally closed alarm input at the back of the unit
- Manual – created every time the record button is pressed

Note: See installation guide for information on how to set up alarms.

a. Via front panel

To select alarm indicator press 'menu' and use left and right direction keys until correct icon is reached

Press 'enter' to select

To scroll through alarm events use up and down direction keys

Choose alarm event and press enter

Use up and down direction keys to select recorded event

Use right and left direction keys to select action

b. Via remote control

To select alarm indicator press 'menu' and use left and right direction keys until correct icon is reached

Press 'enter' to select

To scroll through alarm events use up and down direction keys

Choose alarm event and press enter

Use up and down direction keys to select recorded event

Use right and left direction keys to select action

c. Via keyboard

To select alarm indicator, press 'search'

To scroll through alarm events use up and down direction on joystick

Choose alarm event and press enter

Use up and down direction on joystick to select recorded event

Use right and left direction on joystick to select action

d. Via touch screen monitor

To select alarm indicator touch alarm key  at the top left hand side of the screen

Use touch screen interface to select alarm events

Use up and down scroll bar to select recorded event

Press USB, email, playback to select action

Chapter 9: Backup / Export

Backup methods explained:

- DVD – compatible with DVD+RW, DVD+R, DVD-RW, DVD-R
- USB – USB flash drives are removable, rewritable data storage devices with a Universal Serial Bus (USB) interface
- Temporary hard drive space – save a backup clip to an area on the NVR hard drive that will not be overwritten (only one file at a time). To access saved backup clip, use Backup Manager program or web-based browser viewing

Different actions will provide a different export result:

- Email will send a still image
- USB will save a still image
- Playback will take you to the selected event on screen

5. Recorded data *2. Time Frame* *3. Unit selector*

1. Channels *4. Backup bar*

1. 16 bars represent 16 channels. 1 at the top – 16 at the bottom
   Colour code:
   Yellow = alarm record
   Blue = constant record
   Green = no record
2. Time frame = year, month, day, hour, minute
3. Unit selector = the down arrow indicates desired selection
4. Back up bar = this is the orange bar that shows the range of your backup
   Highlights green when back up section has been chosen
5. All recorded data = start, end, now box

File formats

- MULTI-CHANNEL → exports all attached cameras and includes backup manager playback software
- MULTI-CHANNEL SD AVI → exports all attached cameras at standard definition in 1-minute individual AVI files
- CH * HD AVI → exports chosen channel in high definition 1080P in 1 minute individual AVI files

a. Via front panel

Press 'backup' key to begin

Use 'shift' to toggle between 'record data' 'backup range' and 'file format'

Use shift key to select file format

Use up and down keys and the 'enter' key to select your channel

Use 'shift' key to select recorded data, use up and down keys to navigate the time frame and left and right keys to navigate unit selector

For backup range, use left and right keys to navigate, press 'enter' to create start point.

Use left and right keys to determine backup period

Press 'enter' to complete

Once enter has been pressed, a backup start and backup end box will appear. If correct, press the backup key and select export method

Once backup has started, the display screen will revert to live mode, the backup icon will illuminate and flash with percentage rate 

Once complete, the illumination and flashing will stop

b. Via remote control

Press 'backup' key to begin

Use shift key to toggle between record data, backup range or file format

Use shift key to select file format use 

Press 'enter' to select your channel

Use shift key to select recorded data, use  to navigate the time frame and  to navigate unit selector

For backup range, use  to navigate, press 'enter' to create start point

Use  to determine backup period.

Press 'enter' to complete

Once enter has been pressed, a backup start and backup end box will appear

If correct, press the backup key and select export method

Once backup has started, the display screen will revert to live mode, the backup icon will illuminate and flash with percentage rate 

Once complete, the illumination and flashing will stop

c. Via keyboard

Alternative method required

d. Via touch screen monitor / mouse

Press backup  to begin

Select file format by press and scrolling toolbar

Navigate time frame via pressing desired period

Select time by dragging unit selector or use pinch zoom technique

For backup range, press orange bar and drag for required time period

Once drag is complete backup start and backup end box will appear

If correct press the backup from time frame bar and select export method

Once backup has started the display screen will revert to live mode, the backup icon will illuminate and flash with percentage rate 

Once complete the illumination and flashing will stop

Note: For all methods, when selecting backup period ensure file size is less than your backup device capacity. Longer periods may take more time to calculate.

Chapter 10: Event

Within the event menu, there are 2 options:

- System event – refers to the systems performance
- Operating event – refers to designated areas selected by the user

a. Via front panel

To access event manager press 'menu'

Use left and right keys to locate the event manager icon 

Press 'enter' to select

b. Via remote control

To access event manager press 'menu' key

Use  to locate the event manager icon 

Press 'enter' to select

c. Via keyboard

To access event manager press ‘set’

Use left and rights keys to locate the event manager icon 

Press the ‘enter’ to select

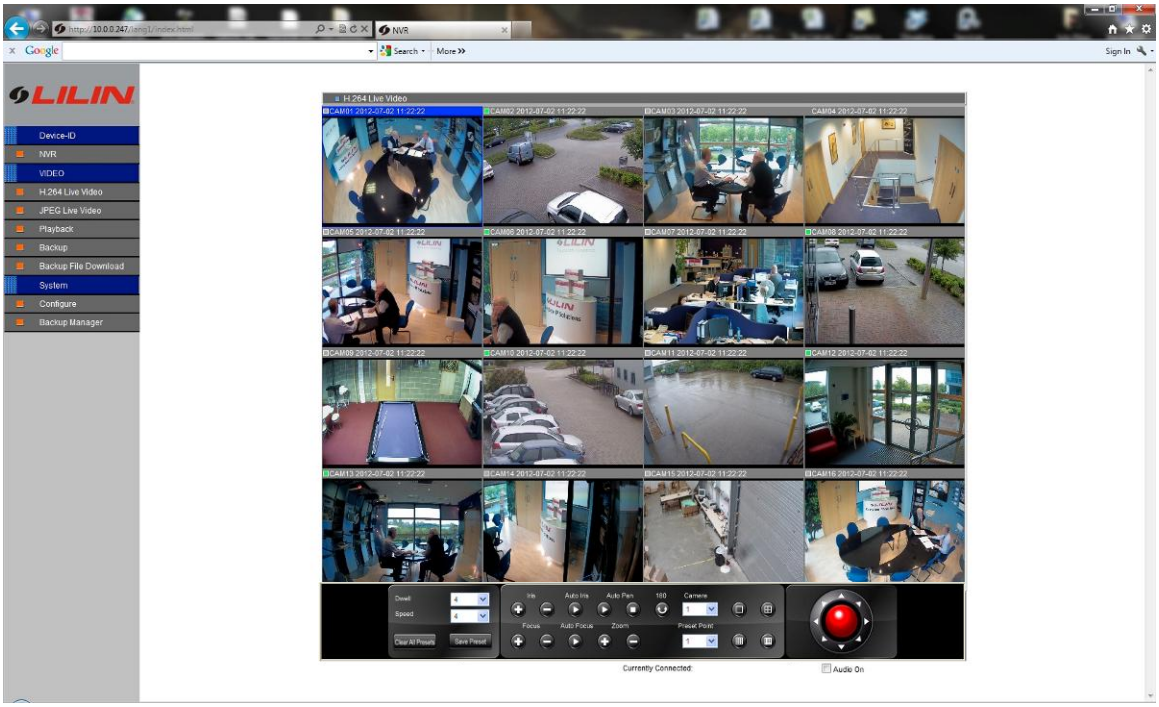
d. Via touch screen/mouse

To access event manager press the menu icon 

Scroll through the menu to locate the event manager icon 

Press enter to select

Chapter 11: Basic web-based browser viewing



Open Internet explorer and enter the NVR's IP address into the address bar

The log on screen will appear

Enter your details

The default username is admin, the default password is 1111.

To bring up a full screen double click on required camera view

Double click to return to multi screen

11.1 Web-based browser playback

Press the playback button on the left hand side

Choose time and date required in calendar search

Press search to activate

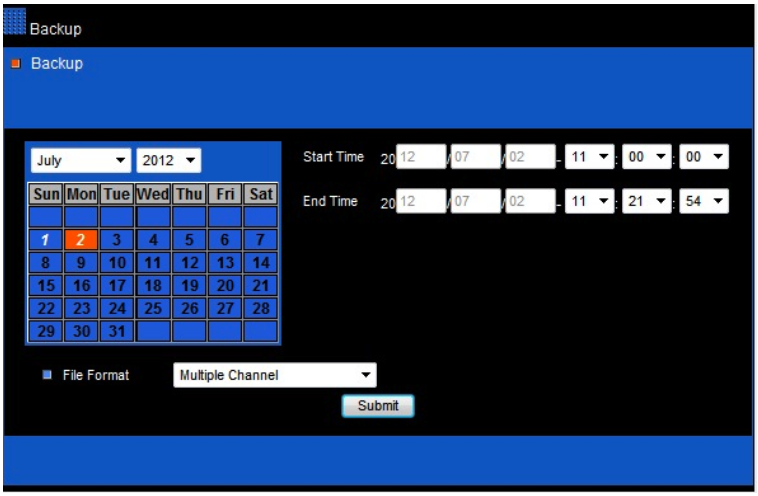
Use the control bar at the bottom of the screen to navigate playback

The selected recorded images will appear in the multi screen
To return to live mode, press your chosen stream, either 'H.264 Live Video' or 'JPEG Live Video'

11.2 Web-based browser backup

Press the backup button on the left hand side

Choose date, start time, end time and format required in calendar search



Press submit. A progress bar will appear.

Once complete you will be taken to the backup file download page

11.3 Web-based browser export (backup file download)

Web based browser export applies to either backups created through the browser or through the temporary hard drive space at the unit

Click required file and save to desired location

Note: To open the downloaded file, you must have the Backup Manager programme installed on your PC. This can be installed from the front page of your web-based browser. Please see backup manager section 12.1 for playing exported files.

Chapter 12: Backup Manager

Backup Manager is a program provided to playback-recorded files from LILIN NVRs and H.264 DVRs

Note: For first time Backup Manager users, please follow the onscreen instructions.

Backup Manager allows you to complete the following actions:

- Playback exported files
- FTP download
- Convert already downloaded files

12.1 Playback exported files

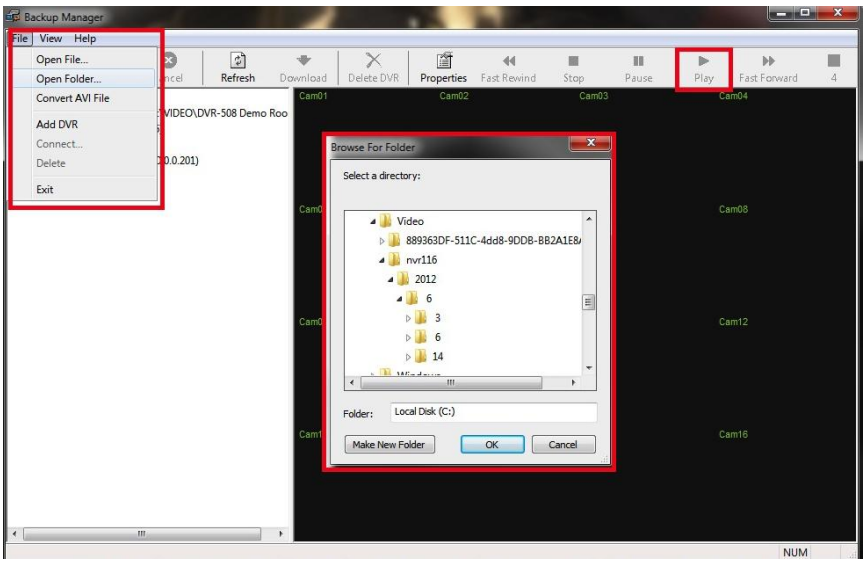
Open Backup Manager

To select files (USB, DVD or web based exported files) click file > open folder

Saved files will then appear

Highlight the desired time from the left hand tree

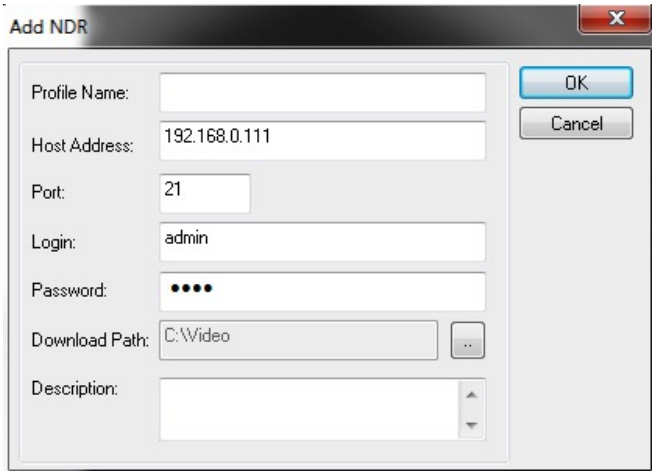
Press play and use the controls at the top to navigate through playback to change the screen view



12.2 FTP Download

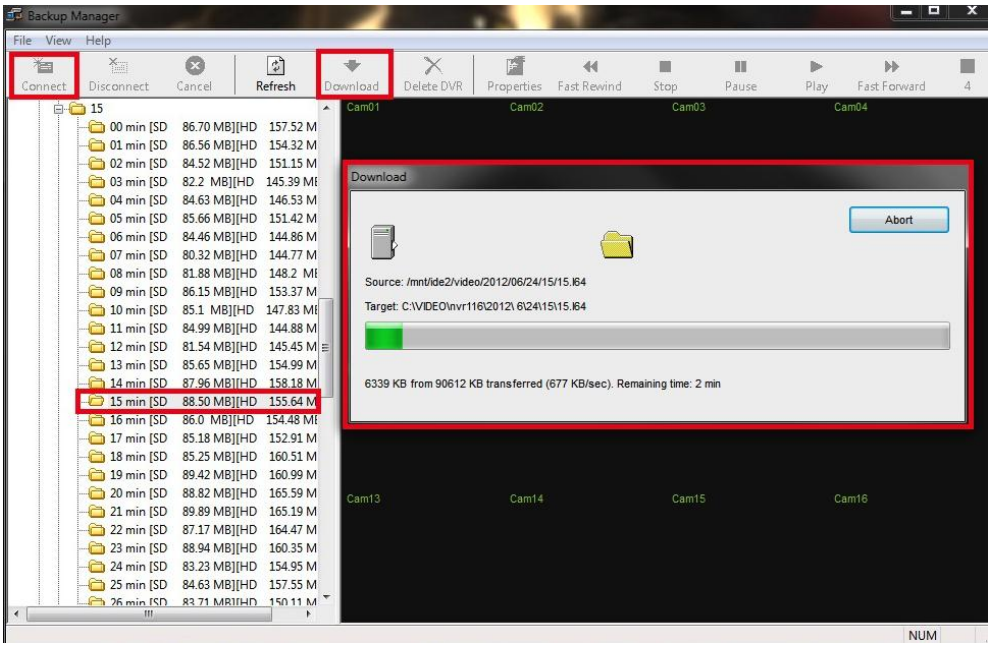
Open Backup Manager

Click file > Add NDR



Insert the IP address of the NVR

Once the address has been added it will remain stored for future use



Highlight your NVR from the left hand bar and click connect

A download panel will then appear. This means the backup manager programme is communicating with your NVR gathering all recorded data. Recorded data will appear on the left hand side. You can access minute breakdowns from the tree.

Highlight your required file then click download from the controls at the top

Your files will begin to download

Downloaded files will show in the Backup Manager programme until deleted

12.3 Convert already downloaded files

Backup Manager allows you to convert multi channel backups to single channel AVI files. To do this follow the steps below:

Open Backup Manager

Click file > convert AVI file

Locate desired backup files

Choose the channels you wish to convert. You can select more than 1 channel.

Click OK to start the conversion

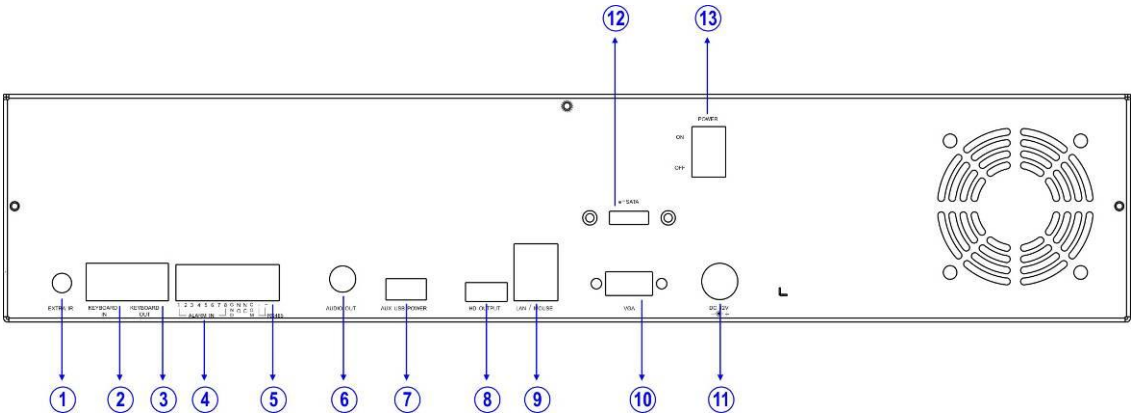
The file will now be saved in your desired location

Quick Installation Guide

This guide has been designed to provide a basic overview of key installation processes. If you require more detailed instructions, please refer to the full installation guide that follows this section

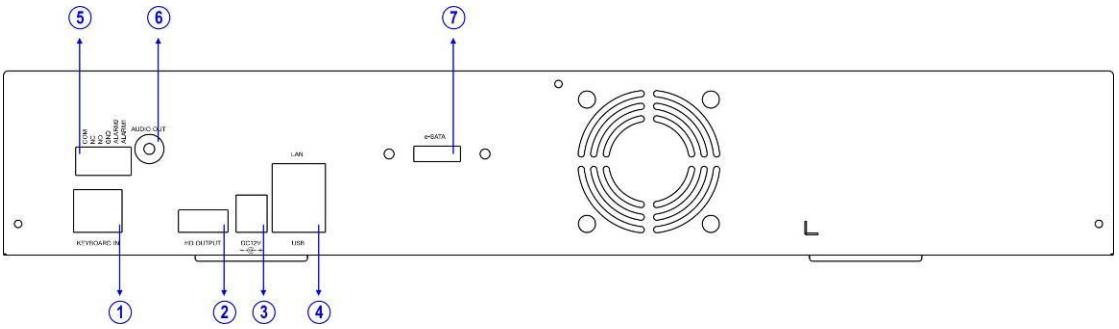
Chapter 1: Rear Panel

1.1 NVR116 Rear View



1. **External IR receiver (RCA)**
2. **RJ-45 Keyboard-in**
   Connected from previous DVR's keyboard output in daisy chain
3. **RJ-45 Keyboard-out**
   Connect to the next DVR's input
4. **Alarm I/Os**
   Alarm 8 input switches, 1 N/O alarm output, and 1 N/C alarm output
5. **RS-485**
   For PTZ connection
6. **Audio Output**
   RCA audio connector
7. **Aux USB Power**
8. **HDMI Output**
9. **LAN / USB Mouse**
   RJ-45 connector and USB mouse
10. **VGA Output**
11. **DC 12V Input**
12. **eSATA Output**
13. **Power Switch**

1.2 NVR109 / NVR104 Rear View



1. **RJ-45 Keyboard In**

2. **HDMI Output**

3. **12V DC Input**

4. **LAN / USB Mouse**
   Network RJ-45 connector and USB mouse.

5. **Alarm I/Os**
   Alarm 2 input switches, 1 N/O alarm output, and 1 N/C alarm output

6. **Audio Output**
   RCA audio connector

7. **eSATA Output**

Connect power supply, monitor, network cable and control device

Note: For easy installation, it is recommended that you connect a touch screen monitor or USB mouse.

Chapter 2: Hard Drive(s)

2.1 Adding hard drive(s)

> **Note:** If you have purchase a unit with a hard drive installed, please ignore sections 2 and 3.

Please ensure unit is switched off

Open unit by removing side and rear screws

Add hard drive(s) using the supplied mounting screws and sata/power cables

Power Unit

Power up unit by turning the switch on the rear to on

2.2 Formatting Hard Drive(s)

> **Note:** See user guide for how to navigate the system, i.e. menu's, camera selection etc.

Enter the setup menu

Select system from the left hand options

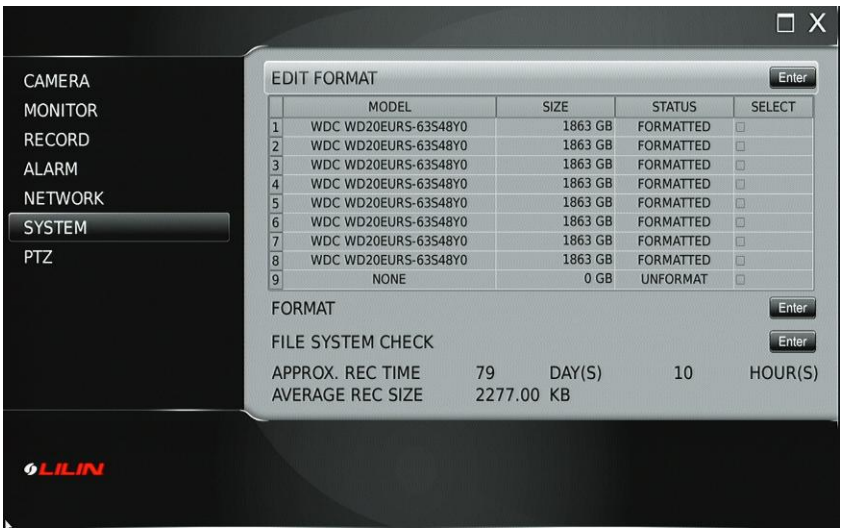
Select HDD info

Installed drives will be listed

Select drive(s) to format

Select enter

Select OK to complete



Chapter 3: Time and Date Settings

Note: See user guide for how to navigate the system, i.e. menu's, camera selection etc.

Enter the setup menu

Select system from the left hand options

Select date/time

Adjust time and date

Select display format

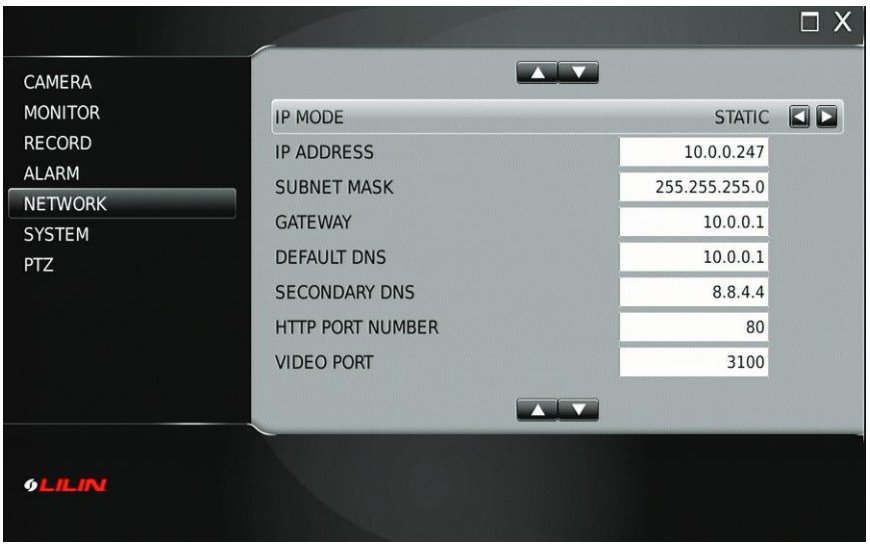
Chapter 4: Network Settings

Note: This guide will refer to a static IP address. For other options, see installation manual.

Enter the setup menu

Select network from the left hand options

Ensure static is displayed under IP mode



Enter your IP address and subnet mask range

Chapter 5: Adding Cameras

Note: The installed IP cameras must be set to the same IP range as the NVR.

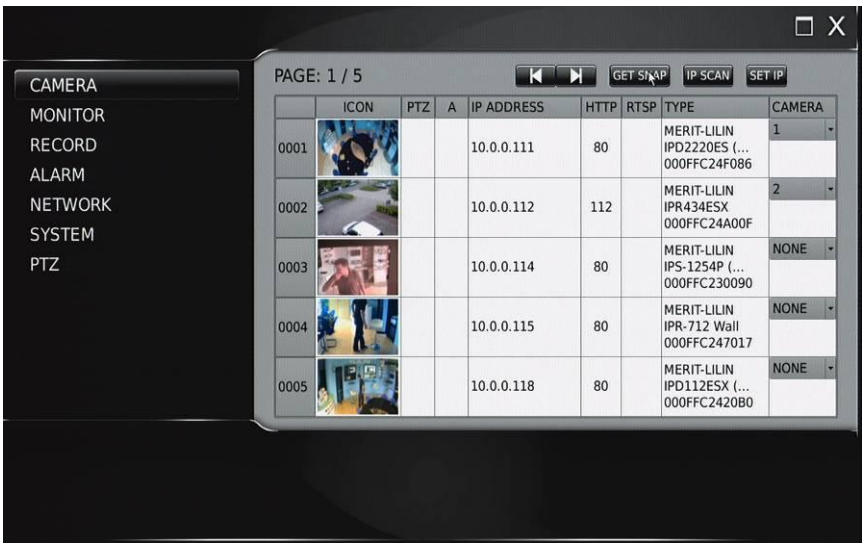
Enter the setup menu

Select camera from the left hand options

Select WS discovery

The NVR will now search the network for installed cameras

Select Get Snap to make camera identification easier



Assign the relevant cameras to a channel by selecting channel number in right hand camera column

Note: If the IP addresses of the installed IP cameras have not already been configured, they can be changed by highlighting the channel and selecting 'Set IP'.

Exit menu setup and all installed cameras will be displayed

By default they are set to record on schedule 24 hours a day

Menu configuration

Chapter 1: Setup Menu

The setup menu contains menu settings for cameras, monitors, recording, alarm, system, network, and PTZ. The details of all the setup menu items are described in this chapter.

1.1 Camera setup

To setup an IP camera, use the following steps:

1.1-1 Camera select

Use the directional arrows to select camera you wish to edit/add

1.1-2 Camera name

A user can enter up to 16 characters for a camera name. To setup the camera name, type the characters using the virtual keyboard and then press the Enter button

Virtual keyboard:

1.1-3 Camera source

To setup a camera channel, you can select IP cam, demo video or no IP connection from this setting

1.1-4 IP Camera address

Once the source is set to an IP camera, you can enter the IP address of the IP camera for that specific channel. To manually set the IP address, press Enter to enable editing via the virtual keyboard. You can also use WS-Discovery for automatic IP address setup.

1.1-5 IP Camera HTTP port

By default, the NVR IP camera 'HTTP' port is set to 80. This can be changed if required.

1.1-6 Video RTSP port

By default, the NVR IP camera 'RTSP' port is set to 554. This can be changed if required.

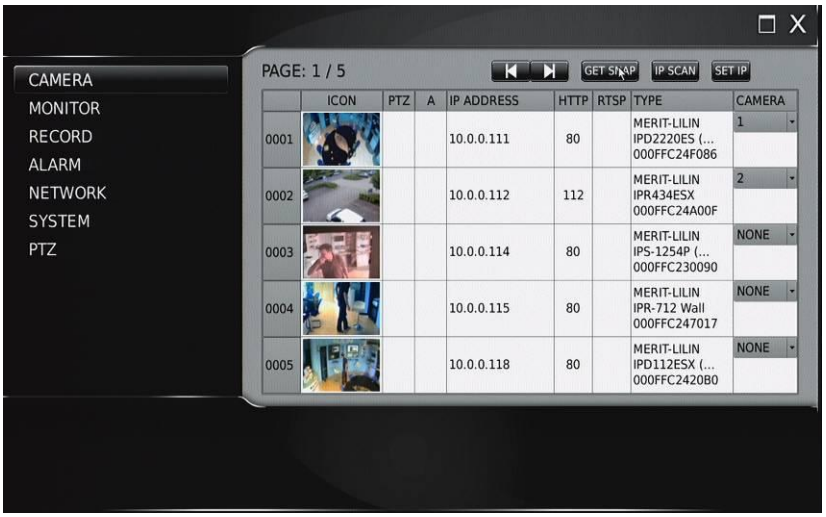
1.1-7 IP Camera setup

To setup an IP camera, follow these instructions.

- Camera IP address: the IP address of the IP camera
- Camera HTTP port: the HTTP port number of the IP address (default 80)
- Video RTSP port: the RTSP port number of the IP address (default 554)
- Username: username of the IP camera (default: admin)
- Password: password of the IP camera (default: pass)

1.1-8 WS-Discovery

Web Services Dynamic Discovery (WS-Discovery) is part of the ONVIF protocol for searching IP cameras on a LAN.

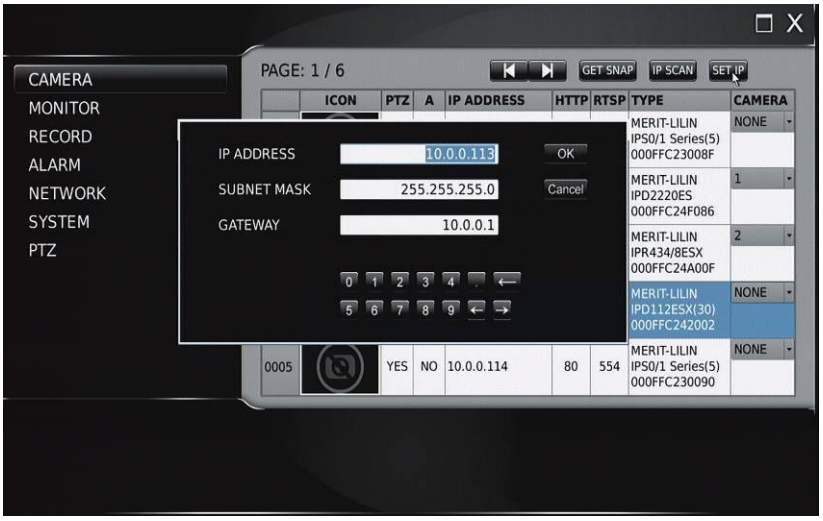


Use this utility to scan the LAN

After scanning, assign the relevant cameras to a channel by selecting channel number in right hand camera column

'Get Snap' will take an image for each listed camera to make identification easier.

Set IP:



If the IP addresses of the installed IP cameras have not already been configured, they can be changed by highlighting the channel and entering the new IP address

1.1-9 Camera Disable (Secured Recording Channel)

Channel enable feature can disable the live video of a camera

The channel can still perform video recording

1.1-10 Video Setup

Contrast, brightness, saturation, sharpness, and load default are configurable per camera

Note: Different HDMI cables can successfully send HDMI signals various distances, depending on the quality of the HDMI cables design and construction. It is best to test entire systems before installing, recommended the HDMI cable length is 2 meters.

1.2 Monitor Setup

For setting up HDMI, VGA, and backlight saving, follow these instructions

1.2-1. Video advance

To setup brightness, contrast, and saturation of a HDMI LCD monitor

1.2-2. Backlight saving

Adjusting backlight saving % reduces brightness of connected monitors, reducing power consumption

1.2-3 Monitor standby time

Monitor standby time can be adjusted

1.2-4 Default division

To select the default screen layout/display on power initialize

1.2-5 VGA advance

To setup brightness, contrast, hue, sharpness and saturation of VGA LCD monitor

1.2-6 VGA output resolution

Set accordingly to match your VGA monitor resolution

1.3 Record setup

Record setup menu allows for setting recording features such as record quality, frame rate, record mode, audio selection, alarm recording, recording resolution, schedule table, HDD overwritten, and limited recording

1.3-1 Camera select

Use the directional arrows to select camera you wish to configure

1.3-2. Resolution

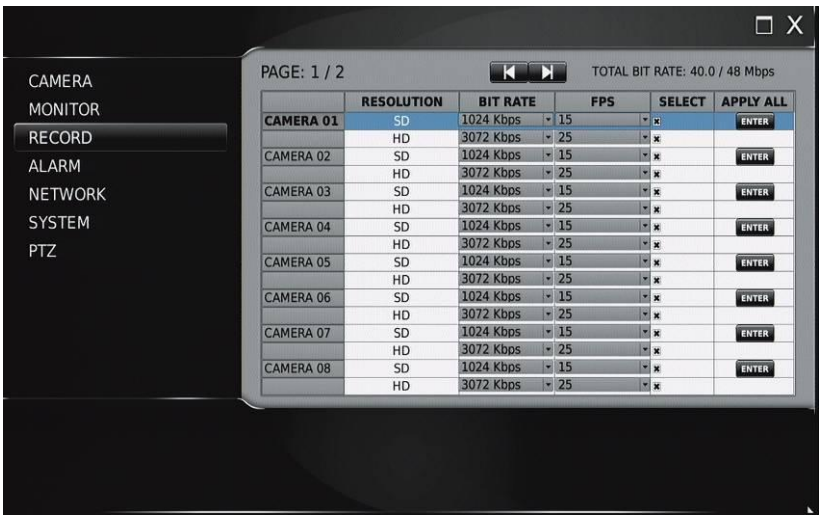
The NVR can provide full HD or SD (D1) quality recording solutions

To change recording resolution, use Left / Right arrows.

Warning: IP network camera must support HD resolution video streaming for HD recording.

1.3-3 Record advance

The NVR is limited to a maximum of 48 MBPS (16 Channel) network throughput. For managing network bandwidth, use Record Advance.



Each Camera can be set to the desired bit rate and frame rate. HD settings are for full screen recording whilst SD relates to multi view display and recording. The total bit rate is displayed in the top right. You cannot exceed the maximum.

1.3-4 Recording mode

Each camera can be set for schedule recording or no recording

1.3-5 Audio

To enable audio recording this feature must be turned on

> **Warning:** Currently only 2MP and 3MP IP network cameras support the audio function.

1.3-6 Post-alarm Recording

Post-alarm recording records the video of a camera after a particular alarm/motion is triggered. This can be set between 1-100 seconds.

1.3-7 Pre-alarm recording

Pre-alarm recording can record the video of a camera before a particular alarm/motion is triggered. To enable pre-alarm recording, turn the option on.

1.3-8 Weighted recording

When weighted recording is activated, the standard camera recording frame rate is increased to the pre-determined rate (set in advance recording), once an alarm is detected by NVR. Without an alarm the camera will record at 1FPS.

1.3-9 Schedule table

The schedule table is displayed as hourly intervals 7 days a week. You can chose whether you want the NVR to record constantly (always), on an alarm event (alarm) or not record (no record). Your chosen method is indicated by a colour code on the time/date grid.

Warning: The schedule table is a universal table and changes will apply to all cameras on the NVR.

1.3-10 HDD overwritten

The NVR can be setup for HDD overwrite. If the user does not want the HDD to be overwritten, turn the option off.

1.3-11 Limited recording

In many countries HDD recording may be limited and can be only accessed for a certain period of time. Once the recorded data passes the chosen period, the data can no longer be accessed. Set your desired period here (in days).

1.4 Alarm setup

Alarm setup menu allows the settings of external alarm switches, motion alarm, buzzer, and alarm recording duration to be changed. To change these settings, enter the Alarm setup menu and follow the instructions:

1.4-1 Camera select

Use the directional arrows to select camera you wish to configure

1.4-2 Alarm input type

The NVR's alarm inputs can be configured as normally open (N/O) or normally closed (N/C) for IP cameras where the alarm signal from an IP camera activates an alarm.

1.4-3 Motion enable

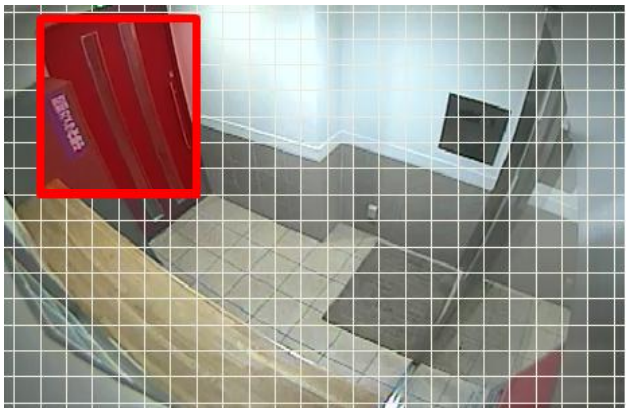
'Motion Enable' enables motion alarm recording, after the motion detection area ('Motion Area Setup') has been set. Press Left or Right at Motion Enable to change the setting.

1.4-4 Motion sensitivity

There are eight levels of sensitivity adjustable for motion alarm triggering, ranging from 'Highest' to 'Lowest'. Press Left or Right to change the sensitivity setting.

1.4-5 Motion area setup

There are a number of ways to set the motion detection area. The detailed setting sequence is described as follows:



	Keypad	Keyboard	Remote controller	Mouse
Step 1	Enter Motion Area Set menu item.			
Step 2	Press Up, Down, Left, or Right to move cursor			Move mouse for starting position
Step 3	Press Enter to define starting area			
Step 4	Press Enter again to finish a motion detection zone			Mouse-drag for an area
Step 5	To clear motion zones press Menu button			Double-click for clear motion zones
Step 6	Press ESC for exit the setting menu			Move mouse to "X" icon and press Left-mouse click to exit motion zone setting

Red indicates motion area

1.4-6 Alarm time

Set the period of time 1-100 seconds the alarm output relay is triggered upon an alarm event

1.4-7 SMTP setup

NVR is capable of sending JPEG snapshots to an email account when an alarm event is triggered. To enable this feature, you must type in the relevant email account information.

1.4-8 FTP setup

The NVR is capable of alarm snapshot to an FTP server. To enable this feature, you must type in the relevant FTP account information.

1.4-9 Buzzer timer

Select a time period you wish the buzzer (on NVR) to sound for upon an alarm trigger. This can be set between 1-100 seconds, it can be set to always or off as required.

1.4-10 Buzzer enable

Turns the audible warning buzzer (on NVR) on or off

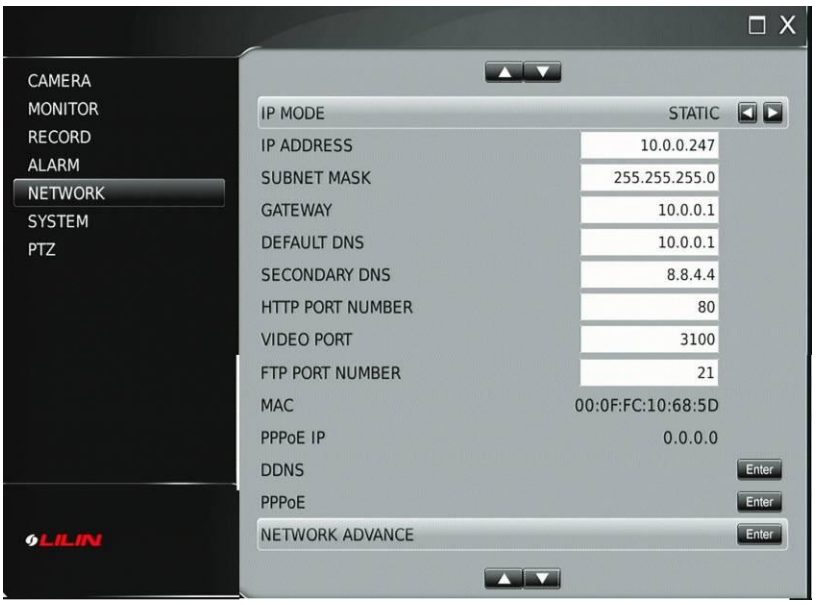
1.4-11 Button sound

Enables or disables button sounds on NVR

1.5 Network setup

In order to connect the NVR to LAN or the Internet you require subnet mask, gateway and IP address. Consult your system administrator for more information.

It is highly recommended that NVR's are accessed on a high bandwidth network such as Gigabit LAN.



1.5-1 IP mode

Set the NVR to Static, DHCP, and PPPoE IP modes. It is highly recommended that NVR's are accessed on high bandwidth network such as Gigabit LAN's.

1.5-2 IP address

Enter the IP address for the NVR using the virtual keyboard

1.5-3 Subnet mask

Enter the Subnet Mask for the network using the virtual keyboard

1.5-4 gateway

Enter the Gateway address for the network using the virtual keyboard

1.5-5 Default DNS

Enter the Default DNS address for the network using the virtual keyboard

1.5-6 Secondary DNS

Enter the Secondary DNS address for the network using the virtual keyboard

1.5-7/8 HTTP Port Number and Video Port Number

For Internet connection, port number IP mapping technologies can be used for a single IP address shared by multiple devices, via a network router. Consult your network administrator for this advanced network support. HTTP Port number is the web service port number of the NVR

Note: Default Internet port numbers for the NVR are:
Port 80 (HTML web page)
Port 3100 (video port)

1.5-9 FTP Port Number

NVR has a built-in FTP server. The FTP service is also used by Backup Manager.exe. Backup Manager can manage all the NVR's playback clips via a network.

1.5-10 MAC

Display the MAC address of the NVR

1.5-11 PPPoE IP

Enter IP address

1.5-12 DDNS

If your NVR has Internet access it will automatically try and register at www.ddnsipcam.com. It will automatically use the last 5 digits of the NVR's MAC address as the host name.

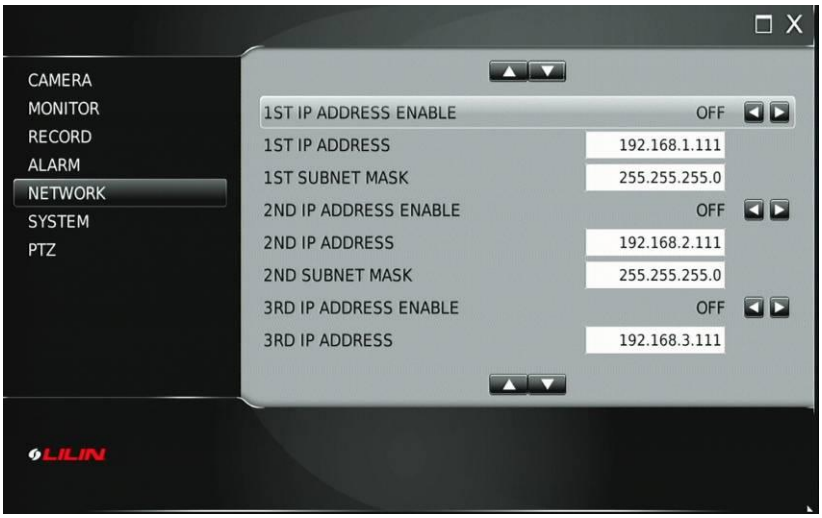
For access enter http://10685D(last 6 digits of MAC).ddnsipcam.com into your browser

Login to the NVR with your default user name and password

1.5-13 PPPoE

To use ADSL modem, enter "username" and "password" provided by the Internet Service Provider (ISP) for the Internet connection service.

1.5-14 Network advance



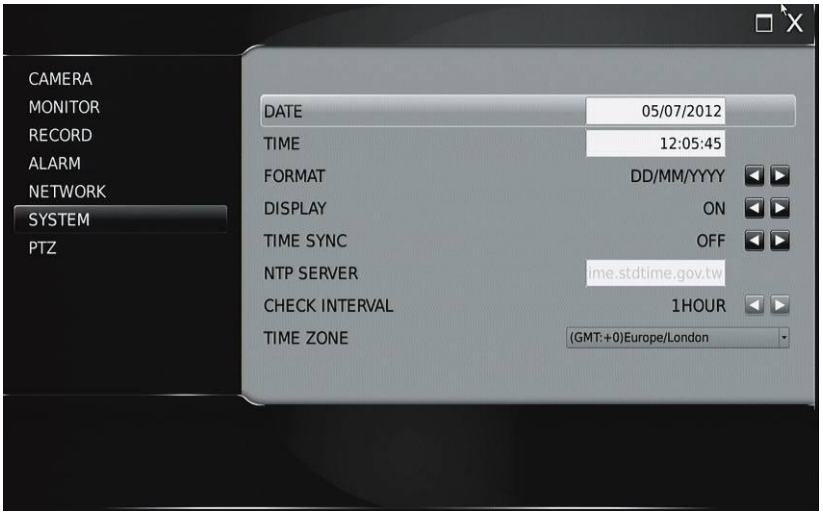
The NVR can have up to 3 network ranges to see cameras across multiple subnet ranges

1.6 System setup

To set up the system settings, use the following instructions:

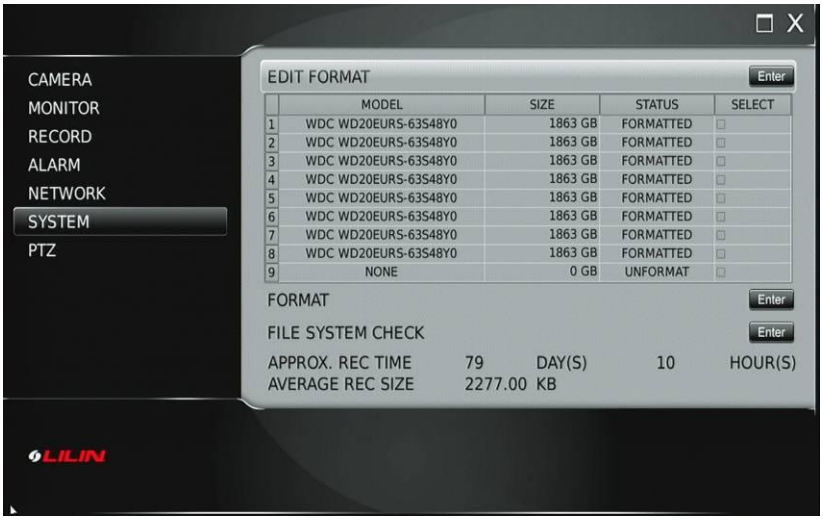
1.6-1 Date/Time

Press enter to set Date/Time on the NVR. The display format can also be set here. If a PIH-931D Keyboard is connected time Sync can be set, the NVR will then sync its time from the keyboard every 15 minutes. Or a NTP (network time protocol) server can be selected.



Warning: When time & date is changed, existing footage already recorded in that time range will be lost.

1.6-2 HDD Info



HDD INFO shows the following information:

- Model — HDD model
- Size —the capacity of the hard disk drive
- Status — indicates whether the HDD is formatted or unformatted
- Select — "□" indicates that the HDD is selected
- Approximate recording hour—recording hours based on the HDD(s)
- Approximate recording days—recording days based on the HDD(s)
- Average REC size—average recording data size

HDD Format

Select the HDD(s) you wish to format, select the HDD format menu item. A password is required for preventing unauthorized access.

A warning message will also prompt you for formatting verification

Warning: Formatting a HDD will erase all recorded data on that drive.

File system check

This function allows you to perform a file system check and repair of the HDD. If a HDD is reported to be defective, run the system check function.

1.6-3 Password/Access

The NVR can be configured for up to 15 users with different access rights

Scroll to select between:

Admin (default password 1111)
Operator (default password 2222)
Guest (default password 3333)
Users 1 to 12

Once a user is selected you can edit passwords, enable password protection and set up the following user rights:

- Allow Setup
- Allow Playback
- Allow PTZ
- Allow Backup
- Allow Division
- Allow Shutdown
- Allow Alarm
- Allow Shortcut
- Allow Network Setup
- Allow Network Playback

Note: In the event of a forgotten password, please contact your sales agent.

1.6-4 Factory reset

A user may want to restore manufacturing default settings. A confirm message will show for final verification. To perform this task, select Factory Reset at System > Factory Reset and press Enter.

Note: Factory reset does not affect IP address, video system, and language settings.

1.6-5 Remote device ID for remote control

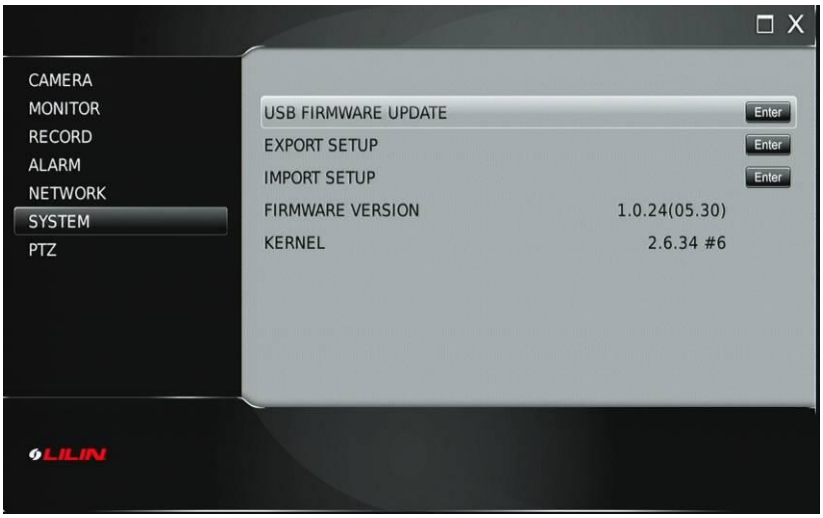
Each NVR can be assigned a unique NVR ID to be accessed by the remote controller. With a unique NVR ID set, the remote controller issues commands to a particular NVR. The rest of NVRs are in sleep mode

1.6-6 Firmware update

Firmware update allows you to upgrade the NVR's firmware for improving system performance. To perform firmware update, press Enter on Setup > System > Firmware Update. There are two ways to perform firmware update (1) via USB flash disk at the NVR site (2) via HTML interface via network

Prepare firmware

To prepare a firmware update, create a directory called 'firmware' in the USB flash disk. The USB flash disk should use the file system FAT-16 or FAT-32. Visit our web site at www.meritlilin.com to download the latest firmware and save the file in the directory mentioned above. The firmware name of the NVR116 is 'Flashnvr116.bin'. The firmware name of the NVR109 is 'Flashnvr109.bin'. The firmware name of the NVR104 is 'Flashnvr104.bin'.



To perform firmware update using USB flash disk, follow the instructions:

1. Plug in a portable USB disk at the NVR's USB port
2. Press Enter to start firmware update
3. After the transfer has finished, remove the USB device and reboot the NVR.
4. Ensure that the firmware is located in the firmware directory of the USB disk

Export setup

The export setup feature allows a user to export internal configuration into a system file on the USB flash disk's firmware directory. The file can later be imported to other machines. The imported machine's internal configuration gets updated based on the original NVR's configuration. To perform Export Setup, select 'Export Setup' and press Enter.

Import setup

To perform Import Setup feature, select 'Import Setup' and press Enter.

The configuration of the NVR is updated based on the system file

Firmware and kernel version

Version menu item indicates the current version number of the NVR

1.6-7 Language

The NVR provides multi-language OSD support. Users can change the preferred language to operate the NVR.

Press Left or Right to change the language setting

1.6-8 Audio volume

To turn on or off live audio volume monitoring, set Live Audio option.

1.6-9 Health check

The NVR can perform a system check on the following areas:

- Temp Monitor
- NVR internal temperature indicator
- FAN Monitor
- Fan failure indicator
- HDD Write Speed
- HDD writing speed indictor
- HDD Read Speed
- HDD reading speed indictor

1.7 PTZ setup

The NVR can control RS-485 PTZ or IP PTZ cameras. To setup PTZ connection, follow these instructions:

1.7-1 Camera select

Use the directional arrows to select the camera you wish to edit

1.7-2 PTZ transport

Select from ONVIF, HTML or RS-485 transport. If RS-485 is selected the camera must be connected to the RS-485 output on the back of the NVR.

1.7-3 PTZ protocol

PTZ protocols include MLP1, MLP2, Pelco D, and Pelco P.

1.7-4 PTZ model and baud rate

If the PTZ protocol is transmitted via traditional RS-485 wires attached to the NVR you need to setup the baud rate and RS-485 ID respectively.

Table below shows listed models in the PTZ protocol list:

Model	Baud Rate	Number of Bytes
PIH-7000 (MLP1)	9600	3
PIH-7600 (MLP1)	9600	3
PIH-7625-3 (MLP1)	9600	3
PIH-7625-7 (MLP2)	9600	7
PIH-7622-7 (MLP2)	9600	7
Pelco D	2400~9600	None
Pelco P	2400~9600	None

1.7-5 Preset setup

All features of PTZ can be configured from the live menu. You can also enter preset positions through the preset set up option in the PTZ menu

Setting preset

Enter the preset setup then select your desired preset point from the dropdown bar

Enter dwell

Define the dwell time of a preset using the dropdown menu to select desired time. Dwell number ranges from 0 to 255 seconds (the shortest to the longest).

Speed

Define the speed of the previous preset to the next preset, using the dropdown menu to select desired time. The speed number ranges from 1 to 8 (the slowest to the fastest). The speed might vary based on different PTZ camera's settings.

Position

Use the joystick/controller to adjust the preset PTZ to your desired location

Iris and auto iris
Adjust these settings as required

Focus and auto focus
Adjust these settings as required

Save presets
Once the above parameters are entered, the preset can be saved.

Clear all presets
To clear all the preset points of a PTZ camera, select 'Clear All Presets' and press Enter key on the front panel or remote control.

Direct keyboard access
Direct keyboard Access mode allows RS-485 protocol to be directly transmitted to the RS-485 PTZ device

The NVR no longer handles the conversion of the RS-485 protocol

This enables the user to access the PTZ menus using the connected PIH-931D keyboard

2. Web-based Viewing/Setup

There are two ways of remotely accessing the NVR:

1. Via a network through your Internet browser
2. Via CMX software (for CMX setup see CMX manual)

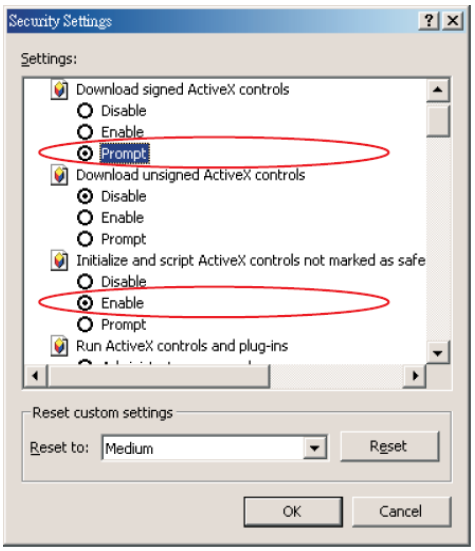
Live monitoring, menu setup, video playback, and file backup can be done by using your Internet browser.

2.1 Before using Internet browser

Add DVR IP address to trusted sites

Make sure that your Internet browser allows signed ActiveX plug-in to run on your PC

Set "Download Signed ActiveX plug-in controls" to "Prompt" and "Run ActiveX control and plug-in" to "Enable" in your internet security options.

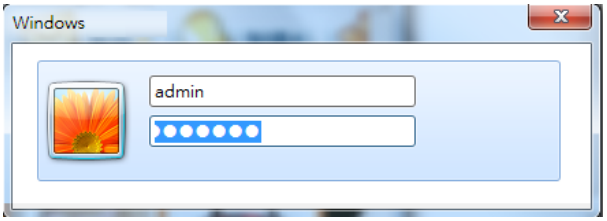


To access these, open Internet Explorer > Tools > Options > Security Settings > Custom Level.

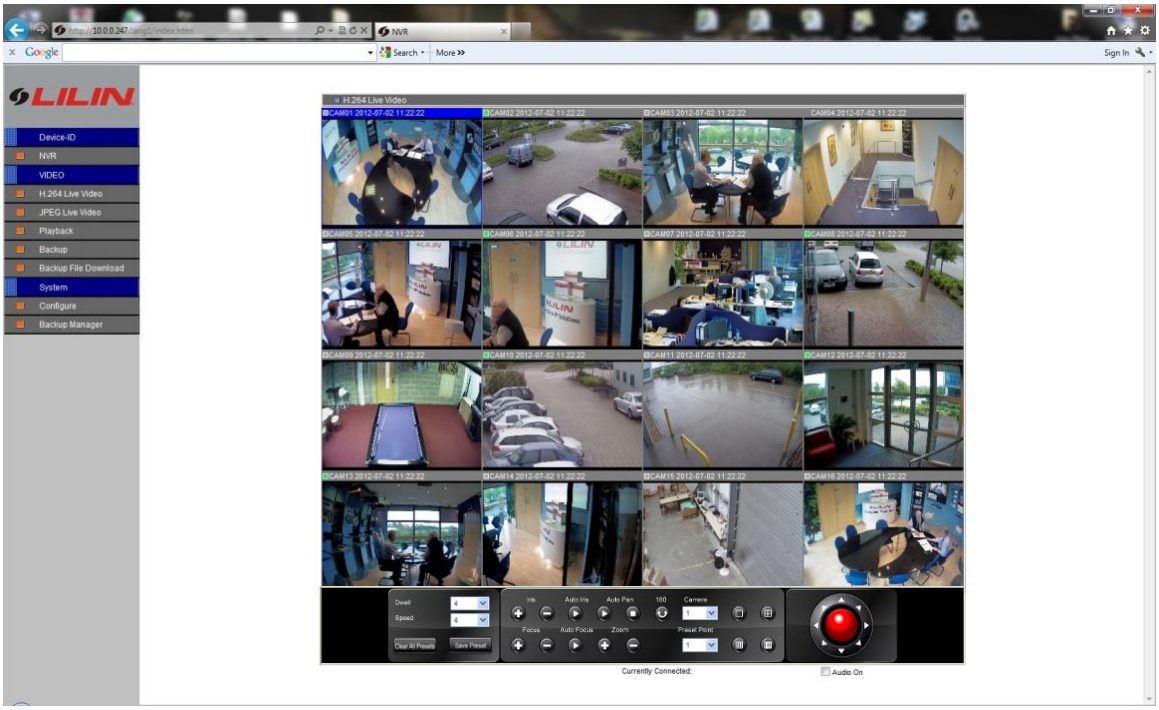
2.2 Logon

Type in the NVR's IP address in the HTTP address box via Internet browser

A log on screen will appear, enter your user name and password



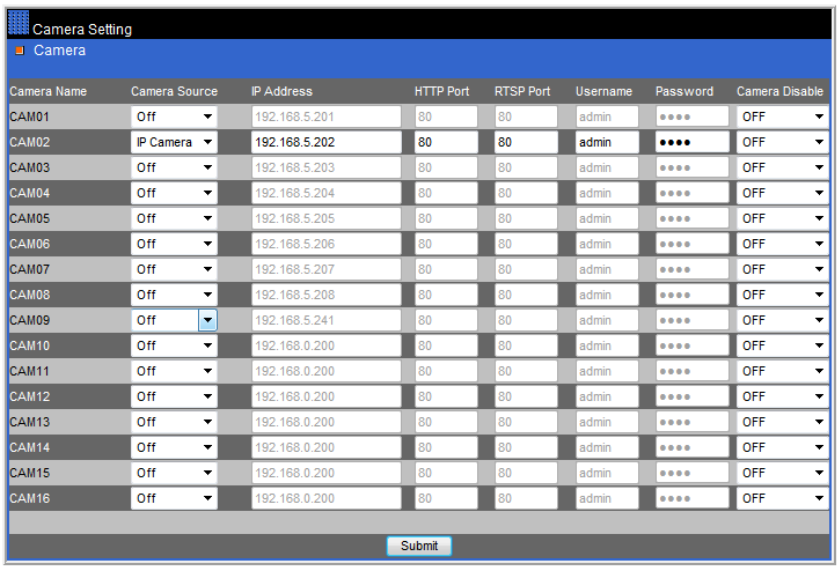
Once entered the NVR home page will appear:



2.3 Configuring the NVR via web page

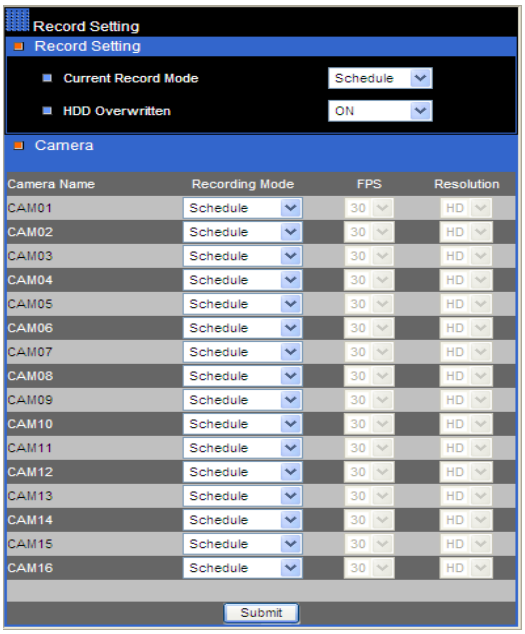
Features of the NVR's main menu system can be configured via web interface. Features such as camera, alarm, recording, network, and backup can all be set up remotely

2.3-1 Camera setting



- Camera Source—select the video source from IP camera, demo or OFF on main monitor
- IP Address—IP address of the IP camera
- HTTP Port—HTTP port of the IP camera
- RTSP Port—RTSP port of the IP camera
- Username – username of the IP camera
- Password – password of the IP camera
- Camera Enable—enable or disable live video on main monitor

2.3-2 Recording setting

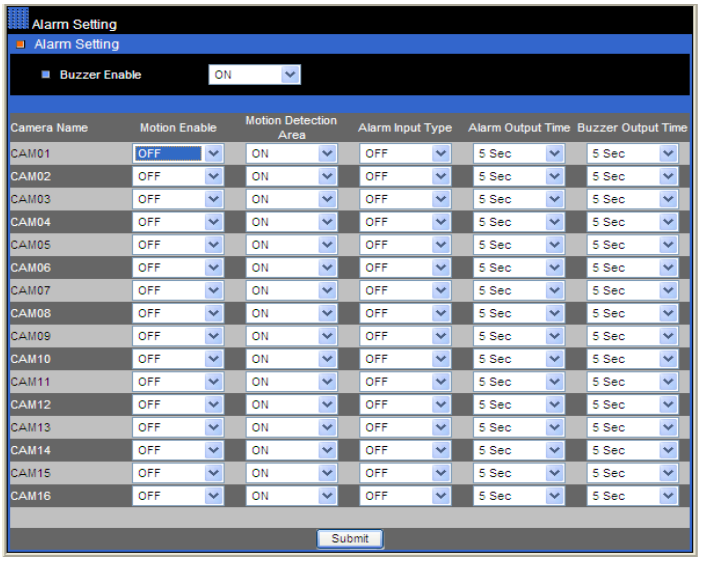


- Current Record Mode—current NVR recording mode
- HDD Overwritten—option for circular recording
- Camera Recording Mode--assign schedule recording or no recording for a camera
- Camera FPS—recording frame rate for a camera
- Camera Resolution—Setup the HD or SD resolution for a camera

2.3-3 Recording schedule table

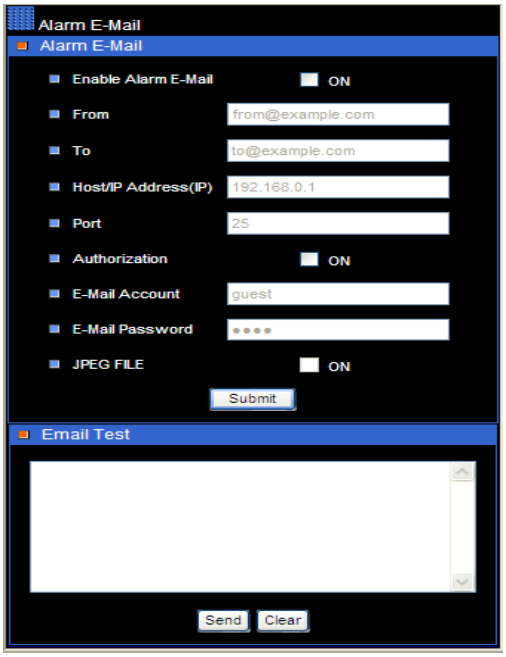
Users can setup the record schedule table via the Internet browser by specifying the day and time for the recording mode

2.3-4 Alarm setting



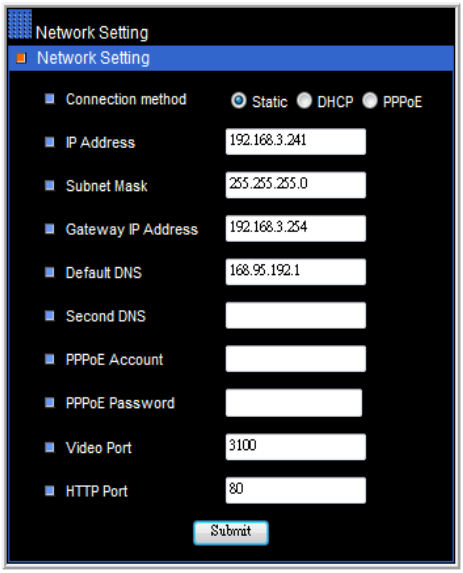
- Buzzer Enable—enable/disable NVR buzzer
- Motion Enable—enable/disable motion detection
- Motion Detection Area—enable/disable motion detection area
- Alarm Input Type—set alarm input as NO/NC or disable
- Alarm Output Time—assign alarm time for each camera
- Buzzer Output Time—assign buzzer time for each camera

2.3-5 Alarm e-mail



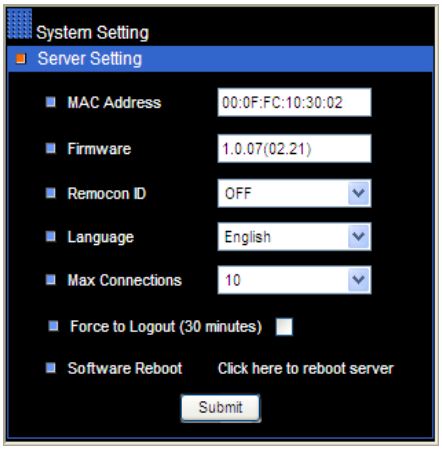
- Enable Alarm Email—option for enable alarm/motion email
- From—from email address
- To—to email address
- Host/IP Address—SMTP mail server's IP or DNS address
- Authentication—option for user and password authentication
- Email Account—senders email account
- Email Password—senders email account's password
- JPEG File—option for the enable JPEG file attachment
- Email Test—simple the Email function testing

2.3-6 Network setting



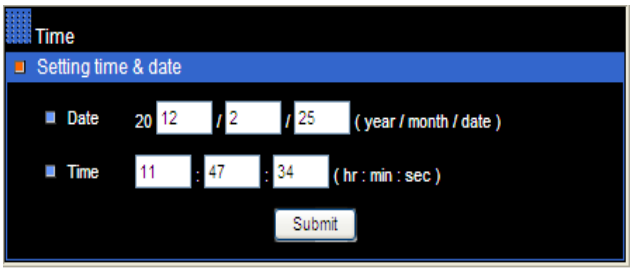
- IP Address—NVR's IP address
- Subnet Mask—subnet mask
- Gateway IP Address—router/Gateway IP address
- PPPoE account—PPPoE protocol account name
- PPPoE password—PPPoE password
- Video Port—the NVR's video port
- HTTP Port—HTML port number

2.3-7 System setting



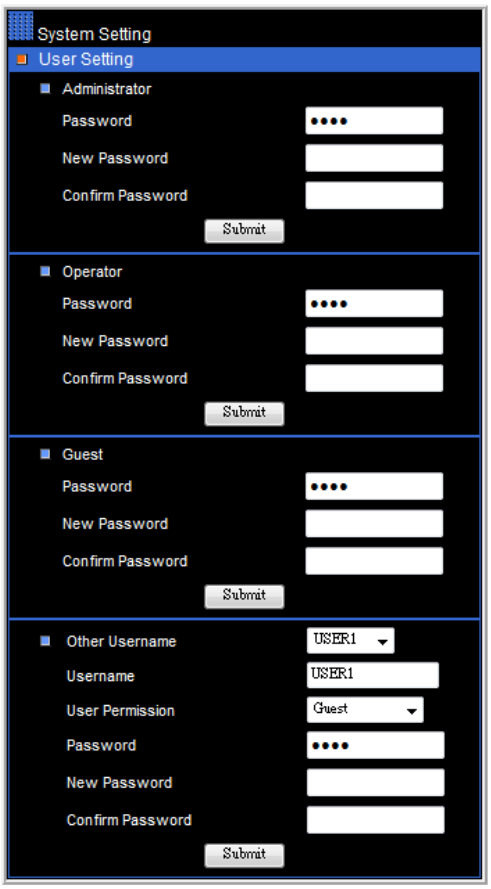
- MAC Address: MAC address of the NVR
- Firmware: firmware version of the NVR
- Remocon ID: addressable NVR ID for multiple NVRs remote control using remote controller and RS-485 keyboard
- Language: language selection of the NVR
- Max Connections: maximum network connections allowed for the NVR
- Force to Logout: force to logout remote access
- Software Reboot: software reboot of NVR system

2.3-7-1 Time



- Date: Current date of the NVR
- Time: Current time of the NVR

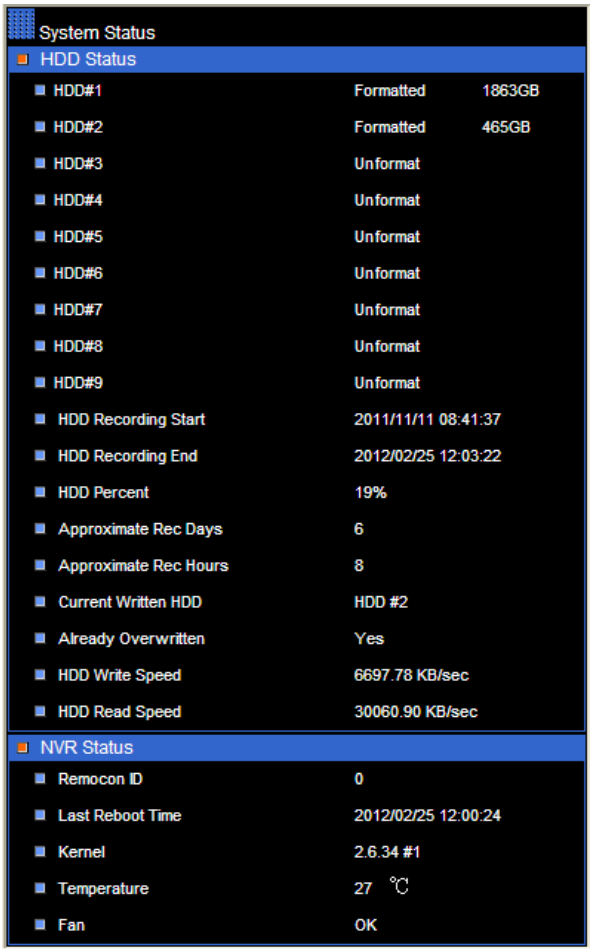
2.3-7-2 User setting



- There are three levels (admin, operator and guest) of user authentication allowed in the NVR.
- To change password, specify the old password, new password, and confirm password, edit as required.

2.3-7-3 System status

- HDD(s)—HDD(s) detecting status for the NVR
- HDD Recording Start—start recording time of the NVR
- HDD Recording End – end recording time of the NVR
- HDD Percentage – recording percentage of the NVR
- Approximate Rec Days—total recording hours available for the HDD(s)
- Approximate Rec Hours—total recording days available for the HDD(s)
- Current Written HDD—the HDD of the NVR in writing
- Already Overwritten—the HDD(s) has been overwritten.
- HDD Writing Speed—HDD writing speed detector
- HDD Reading Speed—HDD reading speed detector
- Remocon ID—NVR ID/RS-485 ID
- Last Reboot Time – last time for rebooting the NVR
- Kernel— OS version of the NVR
- Temperature—NVR internal temperature indicator
- Fan—fan failure indicator



2.3-7-4 Firmware update

This NVR is set to perform firmware upgrade via network. After the NVR receives the firmware, it starts to perform firmware upgrade automatically. After finishing the firmware update, the HTML page will reload. The user can then continue to operate the NVR.

To perform network firmware update, click on Browse button and locate the firmware.

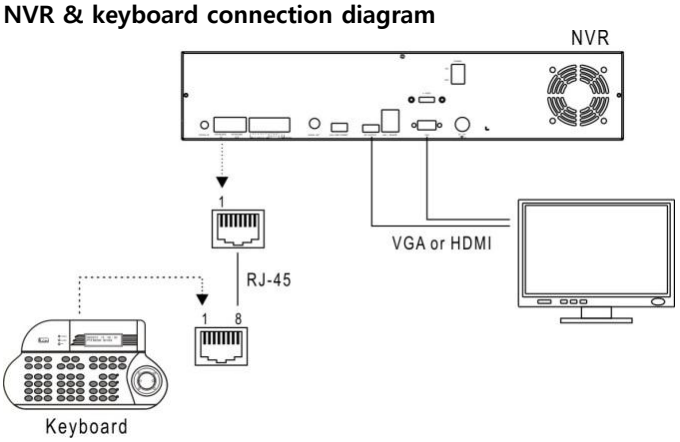
Note: Ensure there is a good connection whilst attempting a firmware update. Failure in the network connection could result in firmware update failure and the unit may become non-operational.

Appendix A

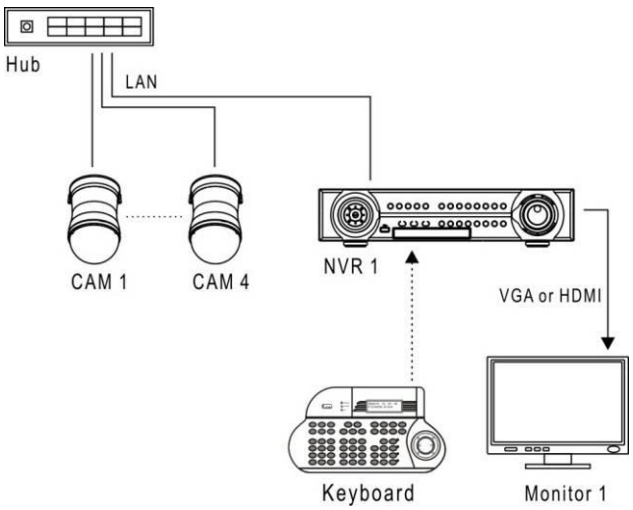
1. Connection between a NVR and a RS-485 keyboard

Directly connect the PIH-931 keyboard to the NVR's keyboard input using an RJ-45 cable. The NVR provides 12V DC for the PIH-931 keyboard. There is no need to connect to your power adapter.

NVR & keyboard connection diagram

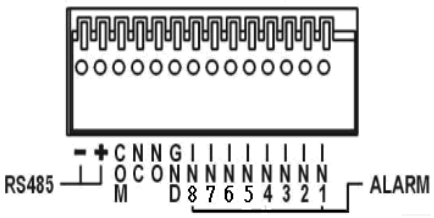


2. Connections between NVR and IP PTZ cameras



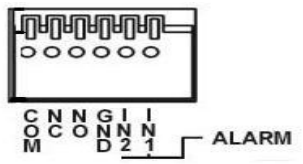
3. Alarm I/Os and RS-485 for PTZ

NVR116



Pin 1	Alarm input 1
Pin 2	Alarm input 2
Pin 3	Alarm input 3
Pin 4	Alarm input 4
Pin 5	Alarm input 5
Pin 6	Alarm input 6
Pin 7	Alarm input 7
Pin 8	Alarm input 8
Pin 9	GND
Pin 10	ALARM NO (normal open)
Pin 11	ALARM NC (normal close)
Pin 12	COM
Pin 13	RS485+
Pin 14	RS485-

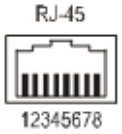
NVR109/104



Pin 1	Alarm input 1
Pin 2	Alarm input 2
Pin 3	GND
Pin 4	ALARM NO (normal open)
Pin 5	ALARM NC (normal close)
Pin 6	COM

Appendix B

RS-485 Input and Output Pin Assignment



Terminal	Name
1	--
2	--
3	--
4	--
5	RS-485 – Out Link Keyboard
6	RS-485 + Out Link Keyboard
7	GND
8	12V + DC input

Appendix C

Hard Drive Support List

Brand	Model	Capacity
WEST DIGITAL	WD20EARX	2TB
	WD20EARS	2TB
	WD20EURS	2TB
	WD20EVDS	2TB
	WD15EURS	1.5TB
	WD10EZRX	1TB
	WD10EARX	1TB
	WD10EARS	1TB
	WD10EALX	1TB
	WD10EURS	1TB
	WD5000AVDS	500GB
	WD5000AVVS	500GB
	WD3200AVVS	320GB
SEAGATE	ST2000DM001	2TB
	ST1000DM003	1TB
	ST3500418AS	500GB
	ST3250318AS	250GB
	ST3160815AS	160GB
HITACHI	HDS723020BLA642	2TB
	HDS721010DLE630	1TB

Appendix D

1. Supported USB-DVD/RW

Manufacturer	Model
SONY	DRX-S30U-W
LITE-ON	eSAU108
LITE-ON	eTAU108
LITE-ON	eHAU424-01

2. Supported DVD Disk

Brand	Specification	Capacity	Max Speed	Note
Melody	DVD-RW	4.7GB	4x	Rewritable
RiTEK	DVD-RW	4.7GB	8x	Rewritable
Sony	DVD+R	4.7GB	8x	Burn once
OEM disk	DVD-R	4.7GB	8x	Burn once

Appendix E

Supported USB Flash Disk

- Transcend: 8G 16G
- Kingston: 4G 8G 16G
- Sandisk: 8G 16G

Appendix F

Hard Disk Recording Table

NVR104

Recording Resolution		**Standard Definition (SD)**		**High Definition (HD)**	
HDD	Size	40	KB/PIC	102	KB/PIC
500	GB	1.5	Days	11	Hours
750	GB	2	Days	17	Hours
1000	GB	3	Days	23	Hours
2000	GB	6	Days	47	Hours

Recording days capacity is calculated by the following formula:

- 2TB HDD, Recording Resolution Setting to = "Standard"
- One day recording capacity of HDD = 40KB * 100 (Total FPS) *60 (Seconds) *60 (Minutes)* 24 (Hours) ÷ 1024 ÷ 1024 =330GB
- Approx. 2TB Recording Day(s) = 2000 GB ÷ 330GB = 6 Days

NVR109

Recording Resolution		**Standard Definition (SD)**		**High Definition (HD)**	
HDD	大小	40	KB / PIC	102	KB / PIC
500	GB	18	Hours	5	Hours
750	GB	1	Days	8	Hours
1000	GB	1.5	Days	11	Hours
2000	GB	3	Days	23	Hours

Recording days capacity is calculated by the following formula:

- For example: 2TB HDD, Recording Resolution Setting to = "Standard"
- One day recording capacity of HDD = 40KB * 200 (Total FPS) *60 (Seconds) *60 (Minutes)* 24 (Hours) ÷ 1024 ÷ 1024 = 660GB
- Approx. 2TB Recording Day(s) = 2000 GB ÷ 660GB = 3 Days

NVR116

Recording Resolution		**Standard Definition (SD)**		**High Definition (HD)**	
HDD	大小	40	KB / PIC	102	KB / PIC
500	GB	9	Hours	2.5	Hours
750	GB	12	Hours	4	Hours
1000	GB	18	Hours	5.5	Hours
2000	GB	1.5	Days	11.5	Hours

Recording days capacity is calculated by the following formula:

- For example: 2TB HDD, Recording Resolution Setting to = "Standard"
- One day recording capacity of HDD = 40KB * 400 (Total FPS) *60 (Seconds) *60 (Minutes)* 24 (Hours) ÷ 1024 ÷ 1024 = 1320GB
- Approx. 2TB Recording Day(s) = 2000 GB ÷ 1320GB = 1.5 Days

Appendix G

Touch Screen Monitor Support List

- Acer: T231H
- Dell: ST2220T

Appendix H

Troubleshooting & FAQ

Question: Should I use a gigabit network switch or a 10/100 MPBS network switch for connecting to the NVR Touch series?

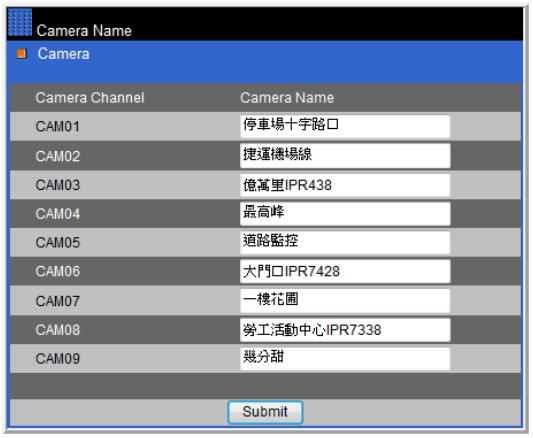
Answer: It is highly recommended to use a gigabit RJ-45 port for connecting to the NVR Touch series. You can still use 10/100 MBPS ports from a switch for connecting IP cameras.

Question: Should I use RTP/UDP protocol for connecting IP cameras to the NVR Touch series?

Answer: In LAN environments please use RTP/UDP protocol (default setting) for connecting IP cameras to the NVR Touch series. It is not recommend that you connect IP cameras via the Internet due to bandwidth issues. If connecting IP cameras via the Internet is essential, please use RTP/HTTP protocol.

Question: Does the NVR Touch series provide unicode (multi-nation) support for camera names?

Answer: Yes, the NVR Touch series provides unicode for camera names. To do so, login to NVR Touch series settings via a browser and open Camera Name section. Here you can edit your unicode camera name.



Question: What are the error codes and how do I solve the connection problem?

Error code: IP LOSS
Explanation: The IP camera is not on the network.
Solution: Check the RJ-45 connection and IP address for the camera.

Error code: AUTH ERR
Explanation: The username and password are incorrect for the IP camera and the NVR Touch.
Solution: The default username for the NVR Touch is 'admin'. The default password is '1111'. If you have changed your username or password, you will need to use this.

Error code: URI ERR
Explanation: The NVR Touch does not support this IP camera.
Solution: Please perform a firmware update for this IP camera.

Error code: PROFILE ERR
Explanation: The H.264 streaming profile might be opened for the IP camera.
Solution: Please enable both H.264 D1 and 1080P both streaming for IP camera. The NVR Touch requires both streamings of high definition (HD) and standard definition (SD). D1 and VGA resolutions are SD streaming. 1080P and 720P resolutions are HD streaming. The NVR Touch does not support streaming above 1080P such as 3MP and 5MP streamings. For 3MP and 5MP IP cameras, please lower the resolution to 1080P or 2MP.

H.264 1080P Real-Time Multi-Touch Standalone NVR Specification			
Models	NVR116D / NVR116	NVR109	NVR104
	D: Internal SATA HDD and built-in Slim DVD/RW -: Internal SATA HDD	-: Internal SATA HDD	
IP Video Supports	Network camera, network speed dome, and video server		
IP Video Input	Up to 16 Channel 1080P	Up to 9 Channel 1080P	Up to 4 Channel 1080P
Max Network Throughput	48 MBPS	32 MBPS	24 MBPS
HDD Disk supported	SATA Port *8	SATA Port *4	SATA Port *2
External RAID Supported	e-SATA Port *1		
Recording			
Recording mode	External alarm / motion detection / schedule / manual		
Resolution	1080P/ 720P/ D1/ VGA		
Recording Video	1080P/ 720P/ D1/ VGA		
Schedule	7 day * 24 hrs time table, recording mode configurable		
Backup	USB 2.0 flash disk / HTTP file download / Audio supported		
DVD/RW	Slim DVD/RW or External USB DVD/RW	External USB DVD/RW	
Playback			
Resolution	1080P/ 720P/ D1/ VGA		
Recording Video	1080P/ 720P/ D1/ VGA		
Speed	FR: 2x, 4x, 8x,16x, 32x, 64x / FF:2x, 4x, 8x,16x, 32x, 64x		
Video Output			
HDMI output	1920 x1080P		
VGA output	Up to 1920 x1080P	None	
Backlight saving	LCD backlight saving mode		
Multi-touch	Support USB multi-touch screen		
Multiplexer	Freeze		
Split screen	4, 8, 9,13,16	4, 8, 9	4
Digital zoom	Up to 64x on live and playback		
Management			
Reports	Full alarm, configuration, and operation reports exporting over HTTP or USB		
Authentication	User authentication with feature configurable		
Recording day	Recording day calculator		
Alarm/event	DI * 8 and DO* 2 (NO/NC)	DI * 2 and DO* 2 (NO/NC)	
Motion	Motion grid 20*12 each channel, 8 sensitivities		
Event	External alarm, video loss, stop recording, power recovering, motion detection, schedule, logon, HDD format		
Email	Alarm notification with JPEG attachments		
Accessories	Remote controller addressable up to 255 NVRs		
PTZ protocol	LILIN MLP1/ 2 and Pelco D/ P		
Keyboards	PIH-931D keyboard		
IR receiver	Extra IR extension connector	None	
RS-485/RS-232	RS-485 keyboard connector, Input and output *2, 12V output, RS-485 PTZ output *1	RS-485 keyboard connector Input *1 , 12V output	
Jog & Shuttle	FF, FR, Step, instant rewind, menu setup	None	
Mouse	USB, mouse-click, mouse scroll, mouse drag		
Audio out	RCA, 1 output		
Remote control	Yes		
Network Ports	Gigabit LAN, RJ45 *1		
Network	Direct Internet browser access / multiple users access		
Protocols	ARP / TCP/IP / UDP / HTTP / SMTP / FTP / DDNS		
Web	Live / event log & time search playback / AVI		
NVR status	HTML NVR status		
IP Scan	IP Scan supported, automatically quick IP address setup for IP cameras and NVRs		
Software			
Backup Manager	Multiple NVRs FTP file download and multi-channel playback		
Mobile phone	iPhone, iPad, Black Berry and Android mobile phone supported		
Others			
WDT	Hardware watchdog timer		
DST	Daylight saving time		
Multilanguage	English, Chinese,		
CPU/OS	ARM Cortex A9 Processor @ 600 MHz CPU, Linux 2.6 kernel		
Power	DC 12V, 10A / 120W	DC 12V, 5A / 60W	DC 12V, 4.2A / 48W
Working Env.	Temp: 0℃ ~ +45℃ / Humidity: 0%~80%		
Dimension	434 * 411.4 * 88 mm	360 * 308 * 60 mm	
Weight	5.0 Kg (w/o HDD)	3.0 Kg (w/o HDD)	

MERIT LILIN ENT. CO., LTD
http://www.meritlilin.com

66-NVR116CSE